Fifth Bimonthly Report

Groundwater Monitoring Wells at the Luis Muñoz Marín International Airport (LMMIA)

CARIBBEAN AIRPORT FACILITIES, INC.

Ref.: 354-2016.02.04 5th Bimonthly Report CAF Monitoring Wells Sampling Report FOIA

02/29/16



EXECUTIVE SUMMARY

As part of the *Subsurface Investigation Plan ("SIP")*, developed on March 2012 to delineate the vertical and horizontal extent of subsurface contamination with jet fuel products in the soils and groundwater in the vicinity of the Caribbean Airport Facilities, Inc. (CAF) at the Luis Muñoz Marin International Airport (LMMIA), progressive reports are to be presented on a bimonthly basis to the U.S. EPA.

This report summarizes activities performed after the installation of monitoring wells at the Luis Muñoz Marin International Airport (LMMIA) mainly in areas operated by Caribbean Airport Facilities, Inc. (CAF). This fifth bimonthly report herein summarizes events documented until the week ending Friday, February 26th, 2016.

SIGNATURE OF ENVIRONMENTAL PROFESSIONAL

A **Subsurface Investigation** effort was performed to identify any evident, current and/or potential, environmental contamination at the Luis Muñoz Marin International Airport (LMMIA) property lot, operated by Caribbean Airport Facilities, Inc. (CAF). This study was performed as per the reguest of **Ms. Jean Tirri**, representing CAF.

Environmental Professional's Signature

Name: Fernando L. Rodríguez, P. E., SC

1.0 Introduction

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Fifth Bimonthly Report

Groundwater Monitoring Wells at the Luis Muñoz Marin International Airport (LMMIA)

1.0 Introduction

The period encompassed within the past two (2) months includes:

The first week of January (week ending Friday, January 8, 2016) through the last week of February (week ending Friday, February 26, 2016).

Within this period, the **Fourth Groundwater Bimonthly Sampling** event was scheduled and performed. Daily Activities for both sampling days are herein included (January 12-13, 2016). No major weather nor airport operational delays occurred during those two (2) days of sampling activities. All sampling and QA/QC procedures were followed by all project teams involved.

As detailed by the Third Party Validator, some results were identified by the laboratory as with quality issues but none of the results were rejected or rendered invalid for decision taking purposes. Tabulated Results of this sampling are included as an attachment to this section. In addition, a comparison table is included showing results from the initial sampling (May 2015) and the bimonthly sampling events performed on September 2015 and November 2015 for simplified comparison with this (January 2016) and future results.

Significant reduction in TPH-GRO or volatile range levels are seen throughout both shallow wells and deep wells. This parameter represents lighter petroleum hydrocarbons than TPH-DRO, also referred to as the semivolatile range. Spikes or reemergence in TPH-GRO results have been seen in several areas since the initial sampling.

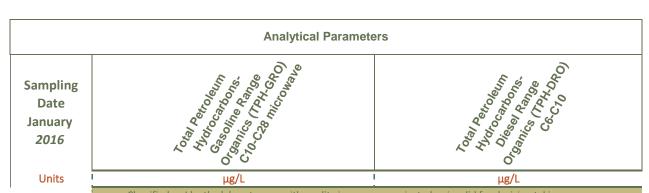
The TPH-DRO results show increases and decreases confirming transmissivity or movement of product. Increases are seen throughout the grid with the exception of wells: MW3D, MW7S, MW9D, MW10D, MW11S, and MW11D.

The corresponding Third Party Data Validation Report for these results is included at the end of this report (after the References). In addition, Monthly Groundwater Levels Measurements recorded during this period are included with Daily Activities Reports included in Section 2.0 as well as an updated copy of the Groundwater Levels Measurement Database in Section 3.0.

Caribbean Airport Facilities, Inc. - Subsurface Investigation Project

Tabulated Data received from: Advanced Environmental Laboratories, Inc.

Bimonthly Groundwater Sampling Results



				Classified as	J by the laboratory a	is with quality issues; i	none rejected o	r invalid for decision i	taking purposes.
	Lab Group Number	Lab Sample #	Date Collected	Result	Method Detection Limit (MDL)	Limit of Quantitation (LOQ)	Dry Result	Method Detection Limit (MDL)	Limit of Quantitation (LOQ)
MW11D-W01	1623189	8204475	1/12/2016	ND	20	50	66	31	96
MW11S-W01	1623189	8204476	1/12/2016	ND	20	50	610	31	96
MW10D-W01	1623189	8204477	1/12/2016	ND	20	50	66	31	96
MW10S-W01	1623189	8204478	1/12/2016	ND	20	50	57	31	95
MW6S-W01	1623189	8204479	1/12/2016	ND	20	50	120	31	96
Field Blank	1623189	8204480	1/12/2016	ND	20	50	ND	30	95
Equipment Blank	1623189	8204481	1/12/2016	ND	20	50	190	30	95
MW3S-W01	1623189	8204482	1/12/2016	ND	20	50	72	30	94
MW3S-W01 MS	1623189	8204483	1/12/2016	1,200	20	50	1,200	31	97
MW3S-W01 MSD	1623189	8204484	1/12/2016	1,200	20	50	1,400	31	97
MW9D-W01	1623189	8204485	1/12/2016	ND	20	50	380	31	96
MW9S-W01	1623189	8204486	1/12/2016	ND	20	50	860	30	94
MW5D-W01	1623189	8204487	1/12/2016	ND	20	50	190	30	94
MW5D-W01 D	1623189	8204488	1/12/2016	ND	20	50	170	31	96
MW5S-W01	1623189	8204489	1/12/2016	ND	20	50	150	31	96
MW7D-W01	1623189	8204490	1/12/2016	30	20	50	1,000	31	97
MW7S-W01	1623189	8204491	1/12/2016	ND	20	50	180	30	94
MW6D-W01	1623189	8204492	1/12/2016	ND	20	50	140	31	95
MW6S-W01 D	1623189	8204493	1/12/2016	ND	20	50	51	31	96
MW3D-W01	1623189	8204494	1/12/2016	ND	20	50	60	30	94
Trip Blank	1623189	8204495	1/12/2016	ND	20	50	-	-	-

Caribbean Airport Facilities, Inc. - Subsurface Investigation Project

Tabulated Data received from: Advanced Environmental Laboratories, Inc.

			Analytical Parameters						
Bimonthly Ground Results	water Sa	ampling	Sampling Date January 2016 Units	٨	A had have to the last of the	Ox Ook	1	70'47 Petro/enn/Potro/enn/	C6.C70 PRO)
	Lab Group Number	Lab Sample #	Date Collected	Result	Method Detection Limit (MDL)	Limit of Quantitation (LOQ)	Result	Method Detection Limit (MDL)	Limit of Quantitation (LOQ)
MW4D-W01	1623732	8207313	1/13/2016	ND	20	50	140	31	96
MW4S-W01	1623732	8207314	1/13/2016	ND	100	250	4,700	31	95
MW2D-W01	1623732	8207315	1/13/2016	45	20	50	220	31	96
MW2S-W01	1623732	8207316	1/13/2016	ND	100	250	1,100	30	95
MW1S-W01	1623732	8207317	1/13/2016	ND	20	50	390	30	95
MW1D-W01	1623732	8207318	1/13/2016	28	20	50	130	31	95
MW8D-W01	1623732	8207319	1/13/2016	31	20	50	490	30	95
MW8S-W01	1623732	8207320	1/13/2016	ND	20	50	150	30	95
MW8S-W01 MS	1623732	8207321	1/13/2016	1,200	20	50	1,400	30	94
MW8S-W01 MSD	1623732	8207322	1/13/2016	1,200	20	50	1,600	30	95
Equipment Blank	1623732	8207323	1/13/2016	ND	20	50	140	31	97
Field Blank	1623732	8207324	1/13/2016	ND	20	50	ND	31	96
Trip Blank	1623732	8207325	1/13/2016	ND	20	50		1	

Fernando L. Rodríguez, P.E. & Associates

Caribbean Airport Facilities, Inc. Subsurface Investigation Project

Data Comparison Tables. Tabulated Data received from: Advanced Environmental Laboratories, Inc.

	TPH-GRO							
		May-15	Sep-15	Nov-15	Jan-16	Mar-16	May-16	
Shallow Wells	TREND							
MW1-S	\	2100	ND	ND	ND			
MW2-S	\	770	ND	ND	ND			
MW3-S	\	610	ND	ND	ND			
MW4-S	\	5300	ND	ND	ND			
MW5-S	\	76	ND	ND	ND			
MW6-S	\	990	ND	ND	ND			
MW7-S	\	210	ND	ND	ND			
MW8-S	\	270	ND	ND	ND			
MW9-S	\	940	ND	ND	ND			
MW10-S	\	210	ND	ND	ND			
MW11-S		ND	ND	ND	ND			
Max Result TPH-GRO		5300	ND	ND	ND			

	TPH-GRO							
		May-15	Sep-15	Nov-15	Jan-16	Mar-16	May-16	
Deep Wells	TREND							
MW1-D	1	240	26	47	28			
MW2-D	1	360	25	ND	45			
MW3-D	\	410	ND	ND	ND			
MW4-D	\	860	ND	ND	ND			
MW5-D	<u></u>	140	24	ND	ND			
MW6-D	\	390	23	ND	ND			
MW7-D	/	ND	ND	ND	30			
MW8-D	\	540	ND	ND	31			
MW9-D	\	760	ND	ND	ND			
MW10-D	\	89	ND	ND	ND			
MW11-D	\	270	ND	ND	ND			
Max Result TPH-GRO		860	26	47	45			

Fernando L. Rodríguez, P.E. & Associates

Caribbean Airport Facilities, Inc. Subsurface Investigation Project

Data Comparison Tables. Tabulated Data received from: Advanced Environmental Laboratories, Inc.

	TPH-DRO							
		May-15	Sep-15	Nov-15	Jan-16	Mar-16	May-16	
Shallow Wells	TREND							
MW1-S		50	140	160	390			
MW2-S		43	410	630	1100			
MW3-S		ND	48	68	72			
MW4-S		35	3600	3500	4700			
MW5-S		28	67	150	150			
MW6-S		140	270	-	120			
MW7-S	<u> </u>	58	410	190	180			
MW8-S		ND	ND	57	150			
MW9-S		24	400	620	860			
MW10-S	/	ND	ND	ND	57			
MW11-S		ND	620	610	610			
Max Result TPH-DRO		140	/ 3600	3500	4700			

	TPH-DRO							
		May-15	Sep-15	Nov-15	Jan-16	Mar-16	May-16	
Deep Wells	TREND							
MW1-D		20	41	67	130			
MW2-D		33	75	92	220			
MW3-D		ND	62	92	60			
MW4-D	/	30	36	84	140			
MW5-D		ND	-	150	190			
MW6-D		75	95	110	140			
MW7-D		ND	570	720	1000			
MW8-D		40	100	240	490			
MW9-D		160	200	470	380			
MW10-D		ND	47	77	66			
MW11-D		ND	31	110	66			
Max Result TPH-DRO		160	570	720	1000			



Fifth Bimonthly Report

Groundwater Monitoring Wells at the Luis Muñoz Marin International Airport (LMMIA)

2.0 Daily Activities Reports

The following reports include relevant daily notes documented by the "CHES Services Corp. Team". Historical weather data has been included for up to two (2) days prior to the groundwater level readings event, as provided by Weather Underground [1].

Weather Station ID: ISANJUAN16

In addition, observed water levels reported by NOAA's Center for Operational Oceanographic Products and Services (CO-OPS) [2].

NOAA/NOS/CO-OPS Station - San Juan, PR - Station ID: 9755371

Established: Mar 04, 1962 Time Meridian: 60° W Present Installation: Mar 25, 1989 Date Removed: N/A Water Level Max (ref MHHW): 2.77 Sep 18, 1989 Water Level Min (ref MLLW): -1.09 Dec 20, 1968 Mean Range: 1.1 ft. Diurnal Range: 1.58 ft.		
Present Installation: Mar 25, 1989 Date Removed: N/A Water Level Max (ref MHHW): 2.77 Sep 18, 1989 Water Level Min (ref MLLW): -1.09 Dec 20, 1968 Mean Range: 1.1 ft.	Established:	Mar 04, 1962
Date Removed: N/A Water Level Max (ref MHHW): 2.77 Sep 18, 1989 Water Level Min (ref MLLW): -1.09 Dec 20, 1968 Mean Range: 1.1 ft.	Time Meridian:	60° W
Water Level Max (ref MHHW): 2.77 Sep 18, 1989 Water Level Min (ref MLLW): -1.09 Dec 20, 1968 Mean Range: 1.1 ft.	Present Installation:	Mar 25, 1989
Water Level Min (ref MLLW): -1.09 Dec 20, 1968 Mean Range: 1.1 ft.	Date Removed:	N/A
Mean Range: 1.1 ft.	Water Level Max (ref MHHW):	2.77 Sep 18, 1989
	Water Level Min (ref MLLW):	-1.09 Dec 20, 1968
Diurnal Range: 1.58 ft.	Mean Range:	1.1 ft.
	Diurnal Range:	1.58 ft.



Daily Activities Report Prepared by: CHES Services Corp. d/b/a: Fernando L. Rodríguez, PE & Associates Chemical/Environmental Engineering & Industrial Hygiene Consultants www.firaches.com.

Project:	CAF MW Bimonthly Sampling Event				
Address:	LMMIA	Date:	January 12, 2016		

Address:	LMMIA		Date:		January 12, 2	2016			
Phone:	787-751-7810		CHES Representa	tive:	HRM/NDM/D	DP			
Time	Location		,		ctivity / Obse	ervations			
	CAF1	CHES team working	on setting up fo						
	MW11	Arrived for sampling							
	MW10	Arrived for sampling							
9:04	MW6 Near MW5	Arrived for sampling	ved for sampling at location 6						
9:35	& MW7	UPS flight arrived fo	flight arrived for loading.						
9:40	MW6	Done	ne						
9:51	MW3	Arrived and strat to	purged.						
11:57	MW9	Arrived for sampling	at location 9						
12:30	Near MW9 &MW7	UPS flight arrived fo							
12:40	MW5	Arrived for samplinf	at location 5						
13:25	MW7	Arrived for sampling	g at location 7						
14:05	CAF1	Prepping coolers							
16:00	CAF1								
	'		Mo	oving Forward (N	Next Steps)				
Action Item	em				De	eadline	%Completion	Responsible Party	
N/A						N/A	N/A	N/A	
				Weather His	tory				
		Two (2)	days prior to GW	Level Monitoring	event			Special Comments	
	Su	ınday, January 10, i	2016					N/A	
	«	Previous Day				Next Day	>>		
		Daily Weekly Monthly	Custom						
				Actual	Average	Record			
	Te	emperature							
		Mean Temperature		27 °C	26 °C	21.00 (2002)			
		Max Temperature Min Temperature		29 °C 24 °C	28 °C	31 °C (2003) 17 °C (1917)			
	De	egree Days		24 0	22 0	11 ((511)			
		Heating Degree Days		0	0				
								§	
		Month to date heating degree	days	0	0				
		Month to date heating degree Since 1 July heating degree date		0					
[0				
		Since 1 July heating degree da	ys	0	0				
		Since 1 July heating degree dar Cooling Degree Days	ys days	0	0 0 13				
		Since 1 July heating degree day Cooling Degree Days Month to date cooling degree	ys days	0 15 138	0 0 13 130				
	м	Since 1 July heating degree dat Cooling Degree Days Month to date cooling degree Year to date cooling degree date	ys days	0 15 138 138 30 [Base 50]	0 0 13 130				
	м	Since I July heating degree data Cooling Degree Days Month to date cooling degree Year to date cooling degree di Growing Degree Days oisture Dew Point	ys days	0 15 138 138 30 (Base 50)	0 0 13 130				
	М	Since I July heating degree data Cooling Degree Days Month to date cooling degree Year to date cooling degree data Growing Degree Days oisture Dew Point Average Humidity	ys days	0 15 138 138 30 (Base 50) 22 °C 78	0 0 13 130				
	М	Since I July heating degree dated cooling Degree Days Month to date cooling degree of the date cooling degree of the date cooling degree of the date cooling degree date of the date cooling Degree Days obsture Dew Point Average Humidity Maximum Humidity	ys days	0 15 138 138 30 (Base 50) 22 °C 78	0 0 13 130				
		Since I July heating degree dated cooling Degree Days Month to date cooling degree of the date cooling Degree Days obsture Dew Point Average Humidity Maximum Humidity Minimum Humidity	ys days	0 15 138 138 30 (Base 50) 22 °C 78	0 0 13 130				
		Since 1 July heating degree day Cooling Degree Days Month to date cooling degree day Year to date cooling degree day Growing Degree Days Oisture Dew Point Average Humidity Maximum Humidity Minimum Humidity Mecipitation	ys days	0 15 138 138 30 (Base 50) 22 °C 78 87 69	0 0 13 130 130	493 ppm [1027]			
		Since I July heating degree dated cooling Degree Days Month to date cooling degree of the date cooling Degree Days obsture Dew Point Average Humidity Maximum Humidity Minimum Humidity	ys days	0 15 138 138 30 (Base 50) 22 °C 78	0 0 13 130	4.93 mm (1937)			

Ref: Weather Underground



Daily Activities Report

Prepared by: CHES Services Corp. d/b/a: Fernando L. Rodríguez, PE & Associates
Chemical/Environmental Engineering & Industrial Hygiene Consultants
www.firaches.com.

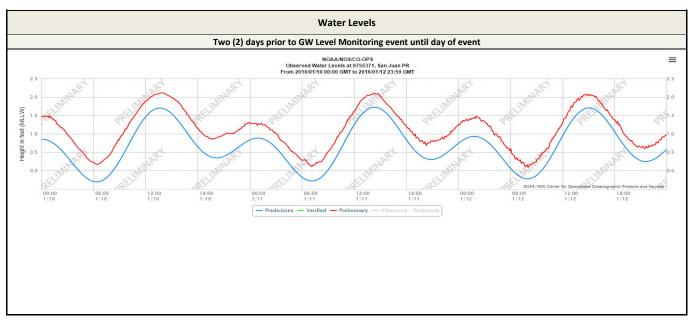
Project:	CAF MW Bimonthly Sampling Event		
Address:	LMMIA	Date:	January 12, 2016

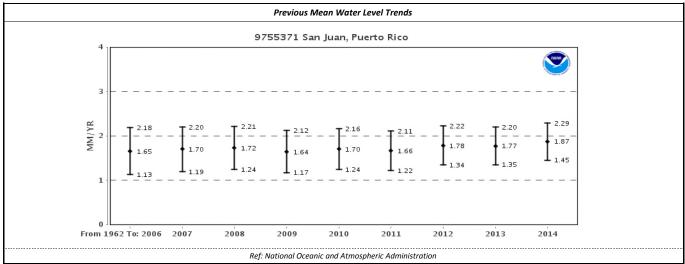
0== (4) 3:		ather History		6
One (1) day prior	r to GW Level IVIO	onitoring even	I .	Special Comm
Monday, January 11, 2016				N//
« Previous Day			Next Day »	
Daily Weekly Monthly Custom				
	Actual	Average	Record	
Temperature				
Mean Temperature	26 °C	26 °C		
Max Temperature	28 °C	28 °C	33 °C (1982)	
Min Temperature	24 °C	22 °C	16 °C [1965]	
Degree Days				
Heating Degree Days	0	0		
Month to date heating degree days		0		
Since 1 July heating degree days		0		
Cooling Degree Days	14	13		
Month to date cooling degree days		143		
Year to date cooling degree days		143		
Growing Degree Days	28 [Base 50]			
Moisture				
Dew Point	21 °C			
Average Humidity	78			
Maximum Humidity	94			
Minimum Humidity	59			
Precipitation				
Precipitation	3.05 mm	3.30 mm	2.21 mm (1902)	
)
Month to date precipitation		1.55		
Month to date precipitation Year to date precipitation	Ref: W	1.55 1.55		
		1.55 1.55 Pather Undergro	und	
Year to date precipitation		1.55 1.55 eather Undergro ather History	und	Special Comm
Year to date precipitation	We	1.55 1.55 eather Undergro ather History	und	Special Comm
Year to date precipitation Day of GV	We	1.55 1.55 eather Undergro ather History	und	· · · · · · · · · · · · · · · · · · ·
Year to date precipitation Day of GV Tuesday, January 12, 2016	We	1.55 1.55 eather Undergro ather History	und Y	· · · · · · · · · · · · · · · · · · ·
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Pay of GV Tuesday, January 12, 2016 « Previous Day	We V Level Monitorii	1.55 1.55 eather Undergro ather History og event	y Next Day »	· · · · · · · · · · · · · · · · · · ·
Pay of GV Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom	We V Level Monitorii	1.55 1.55 eather Undergro ather History og event	y Next Day »	· · · · · · · · · · · · · · · · · · ·
Pay of GV Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom Temperature	We V Level Monitorin Actual	1.55 1.55 eather Undergro ather History ag event	y Next Day »	· · · · · · · · · · · · · · · · · · ·
Pay of GV Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom Temperature Mean Temperature	We V Level Monitorin Actual 26 °C	1.55 1.55 eather Undergro ather History ag event Average	Next Day »	· · · · · · · · · · · · · · · · · · ·
Pay of GV Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom Temperature Mean Temperature Max Temperature	We V Level Monitoria Actual 26 °C 28 °C	1.55 1.55 eather Undergro ather History ag event Average 26 °C 28 °C	Next Day » Record 31 °C [1981]	· · · · · · · · · · · · · · · · · · ·
Pay of GV Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom Temperature Mean Temperature Max Temperature Min Temperature	We V Level Monitoria Actual 26 °C 28 °C	1.55 1.55 eather Undergro ather History ag event Average 26 °C 28 °C	Next Day » Record 31 °C [1981]	· · · · · · · · · · · · · · · · · · ·
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Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom Temperature Mean Temperature Max Temperature Min Temperature Degree Days Heating Degree Days Month to date heating degree days Since 1 July heating degree days	We V Level Monitoria Actual 26 ° C 28 ° C 22 ° C	1.55 1.55 eather Undergro ather History ag event Average 26 ° C 28 ° C 22 ° C	Next Day » Record 31 °C [1981]	· · · · · · · · · · · · · · · · · · ·
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Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom Temperature Mean Temperature Min Temperature Min Temperature Degree Days Heating Degree Days Month to date heating degree days Cooling Degree Days Month to date cooling degree days	We We We We We We We We	1.55 1.55 eather Undergro ather History ng event Average 26 °C 28 °C 22 °C 0 0 0 13 156	Next Day » Record 31 °C [1981]	· · · · · · · · · · · · · · · · · · ·
Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom Temperature Mean Temperature Min Temperature Min Temperature Degree Days Heating Degree Days Month to date heating degree days Cooling Degree Days Month to date cooling degree days Year to date cooling degree days	We V Level Monitoria Actual 26 ° C 28 ° C 22 ° C 0 0 0 13 165 165	1.55 1.55 eather Undergro ather History ng event Average 26 °C 28 °C 22 °C 0 0 0 13 156	Next Day » Record 31 °C [1981]	· · · · · · · · · · · · · · · · · · ·
Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom Temperature Mean Temperature Min Temperature Min Temperature Degree Days Heating Degree Days Month to date heating degree days Since 1 July heating degree days Cooling Degree Days Month to date cooling degree days Year to date cooling degree days Growing Degree Days	We V Level Monitoria Actual 26 ° C 28 ° C 22 ° C 0 0 0 13 165 165	1.55 1.55 eather Undergro ather History ng event Average 26 °C 28 °C 22 °C 0 0 0 13 156	Next Day » Record 31 °C [1981]	· · · · · · · · · · · · · · · · · · ·
Pay of GV Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom Temperature Mean Temperature Min Temperature Min Temperature Degree Days Heating Degree Days Month to date heating degree days Cooling Degree Days Month to date cooling degree days Year to date cooling degree days Growing Degree Days Moisture	We V Level Monitoria Actual 26 ° C 28 ° C 22 ° C 0 0 0 13 165 165 27 [Base 50]	1.55 1.55 eather Undergro ather History ng event Average 26 °C 28 °C 22 °C 0 0 0 13 156	Next Day » Record 31 °C [1981]	· · · · · · · · · · · · · · · · · · ·
Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom Temperature Mean Temperature Min Temperature Min Temperature Degree Days Heating Degree Days Month to date heating degree days Cooling Degree Days Month to date cooling degree days Year to date cooling degree days Growing Degree Days Moisture Dew Point	We V Level Monitoria Actual 26 ° C 28 ° C 22 ° C 0 0 0 13 165 165 27 [Base 50]	1.55 1.55 eather Undergro ather History ng event Average 26 °C 28 °C 22 °C 0 0 0 13 156	Next Day » Record 31 °C [1981]	· · · · · · · · · · · · · · · · · · ·
Pay of GV Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom Temperature Mean Temperature Min Temperature Min Temperature Degree Days Heating Degree Days Month to date heating degree days Cooling Degree Days Month to date cooling degree days Year to date cooling degree days Growing Degree Days Moisture Dew Point Average Humidity	We V Level Monitoria Actual 26 ° C 28 ° C 22 ° C 0 0 0 13 165 165 27 [Base 50]	1.55 1.55 eather Undergro ather History ng event Average 26 °C 28 °C 22 °C 0 0 0 13 156	Next Day » Record 31 °C [1981]	· · · · · · · · · · · · · · · · · · ·
Pay of GV Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom Temperature Mean Temperature Min Temperature Min Temperature Degree Days Heating Degree Days Month to date heating degree days Cooling Degree Days Month to date cooling degree days Year to date cooling degree days Growing Degree Days Moisture Dew Point Average Humidity Maximum Humidity	We V Level Monitoria Actual 26 ° C 28 ° C 22 ° C 0 0 0 13 165 165 27 [Base 50] 21 ° C 78 90	1.55 1.55 eather Undergro ather History ng event Average 26 °C 28 °C 22 °C 0 0 0 13 156	Next Day » Record 31 °C [1981]	· · · · · · · · · · · · · · · · · · ·
Pay of GV Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom Temperature Mean Temperature Min Temperature Min Temperature Degree Days Heating Degree Days Month to date heating degree days Since 1 July heating degree days Cooling Degree Days Month to date cooling degree days Year to date cooling degree days Growing Degree Days Moisture Dew Point Average Humidity Maximum Humidity Minimum Humidity Precipitation	We V Level Monitoria Actual 26 ° C 28 ° C 22 ° C 0 0 0 13 165 165 27 [Base 50] 21 ° C 78 90 65	1.55 1.55 eather Undergro ather History ng event Average 26 °C 28 °C 22 °C 0 0 0 13 156	Next Day » Record 31 °C (1981) 17 °C (1965)	· · · · · · · · · · · · · · · · · · ·
Pay of GV Tuesday, January 12, 2016 « Previous Day Daily Weekly Monthly Custom Temperature Mean Temperature Min Temperature Min Temperature Degree Days Heating Degree Days Month to date heating degree days Cooling Degree Days Month to date cooling degree days Year to date cooling degree days Growing Degree Days Moisture Dew Point Average Humidity Maximum Humidity Minimum Humidity	We V Level Monitoria Actual 26 ° C 28 ° C 22 ° C 0 0 0 13 165 165 27 [Base 50] 21 ° C 78 90	1.55 1.55 eather Undergro ather Histori ing event Average 26 ° C 28 ° C 22 ° C 0 0 0 13 156 156	Next Day » Record 31 °C [1981]	· · · · · · · · · · · · · · · · · · ·



Daily Activities Report Prepared by: CHES Services Corp. d/b/a: Fernando L. Rodríguez, PE & Associates Chemicol/Environmental Engineering & Industrial Hygiene Consultants www.firaches.com.

Project: CAF MW Bimonthly Sampling Event Date: January 12, 2016 Address: LMMIA







Daily Activities Report

Prepared by: CHES Services Corp. d/b/a: Fernando L. Rodriguez, PE & Associates
Chemical/Environmental Engineering & Industrial Hygiene Consultants
www.firaches.com.

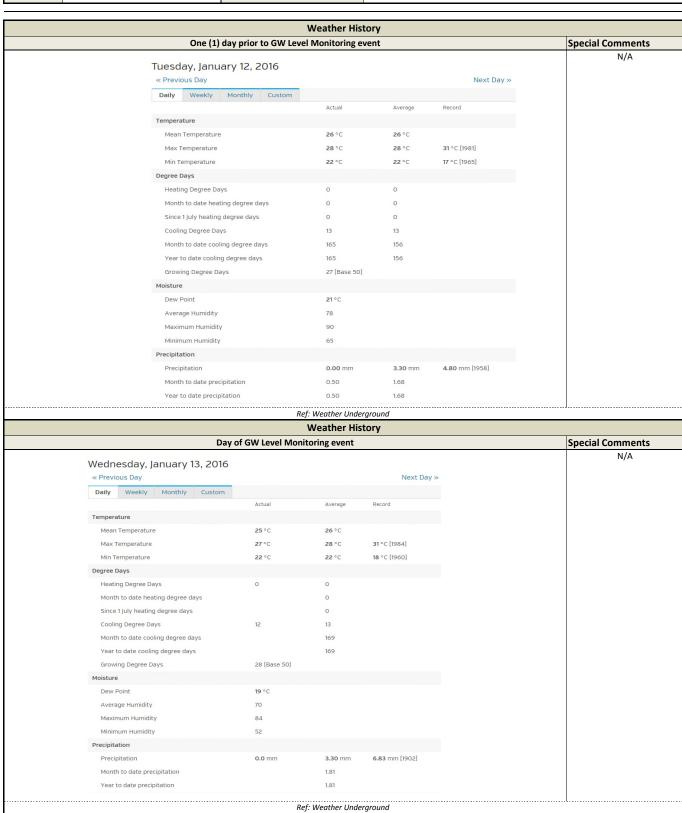
Project:	CAF MW Bimonthly Sampling Event		
Address:	LMMIA	Date:	January 13, 2015

W4	CHES team working on sett Arrived for sampling at loca Arrived for sampling at loca Paused due to pump malful J&S back with equipmnet to Finished fixing pump contin Arrived for sampling at loca Arrived for sampling at loca Prepping coolers Working on shipping UPS Two (2) days print arrived for sampling ups	ation 4 ation 2 Inction. o fix pump. nuing sampling at 2 ation 1 ation 8 Moving Forwa	ard (Next Steps)	Deadline N/A	%Completion N/A Day »	Responsible Party N/A Special Comments N/A
was ear MW8 AF1 Onday, Ja Previous Day	CHES team working on sett Arrived for sampling at loca Arrived for sampling at loca Paused due to pump malful J&S back with equipmnet to Finished fixing pump contin Arrived for sampling at loca Arrived for sampling at loca Prepping coolers Working on shipping UPS Two (2) days print arrived for sampling ups	ting up for the day ation 4 ation 2 inction. o fix pump. nuing sampling at 2 ation 1 ation 8 Moving Forward Weather for to GW Level Monitor	Activity / Obs 2S. ard (Next Steps) Der History oring event	Deadline N/A	N/A	N/A Special Comments
AF1 W4 W2 W2 W2 W1 W8 ear MW8 AF1 Previous Day	Arrived for sampling at local Arrived for sampling at local Arrived for sampling at local Paused due to pump malful J&S back with equipmnet to Finished fixing pump conting Arrived for sampling at local Arrived for sampling at local Arrived for sampling at local Prepping coolers Working on shipping UPS Two (2) days pring the pring th	ation 4 ation 2 inction. o fix pump. nuing sampling at 2 ation 1 ation 8 Moving Forwa Weather for to GW Level Monitor	2S. ard (Next Steps) Der History oring event	Deadline N/A	N/A	N/A Special Comments
W4 W2 W2 W2 W1 W8 ear MW8 AF1 Previous Day	Arrived for sampling at local Arrived for sampling at local Arrived for sampling at local Paused due to pump malful J&S back with equipmnet to Finished fixing pump conting Arrived for sampling at local Arrived for sampling at local Arrived for sampling at local Prepping coolers Working on shipping UPS Two (2) days pring the pring th	ation 4 ation 2 inction. o fix pump. nuing sampling at 2 ation 1 ation 8 Moving Forwa Weather for to GW Level Monitor	ard (Next Steps) Der History oring event	N/A	N/A	N/A Special Comments
W2 W2 W2 W1 W8 ear MW8 AF1 Previous Day	Arrived for sampling at local Paused due to pump malful I&S back with equipmnet to Finished fixing pump conting Arrived for sampling at local Arrived for sampling at local Prepping coolers Working on shipping UPS Two (2) days pring pulling 11, 2016	ation 2 Inction. o fix pump. nuing sampling at 2 ation 1 ation 8 Moving Forwa Weather or to GW Level Monitor	ard (Next Steps) D er History oring event	N/A	N/A	N/A Special Comments
W2 W2 W1 W8 ear MW8 AF1 Previous Day	Paused due to pump malful I&S back with equipmnet to Finished fixing pump continuation for sampling at local Arrived for sampling at local Prepping coolers Working on shipping UPS Two (2) days print pulping 11, 2016	o fix pump. nuing sampling at 2 ation 1 ation 8 Moving Forwa Weather	ard (Next Steps) D er History oring event	N/A	N/A	N/A Special Comments
W2 W2 W1 W8 ear MW8 AF1 Previous Day week	J&S back with equipmnet to Finished fixing pump continuation of Finished for sampling at local Arrived for sampling at local Prepping coolers Working on shipping UPS Two (2) days print of Two (3) days print of Two (4) days print of Two (5) days print of Two (6) days print of Two (7) days print of Two (8) days print of Two (8) days print of Two (9) days print of Two (1)	o fix pump. nuing sampling at 2 ation 1 ation 8 Moving Forwa Weather	ard (Next Steps) D er History oring event	N/A	N/A	N/A Special Comments
W2 W1 W8 ear MW8 AF1 proday, Ja Previous Day week	Finished fixing pump continent of the first pump continent of the first pump continent of the first pump content of the fi	nuing sampling at 2 ation 1 ation 8 Moving Forwa Weather	ard (Next Steps) D er History oring event	N/A	N/A	N/A Special Comments
W1 W8 ear MW8 AF1 Previous Day Week	Arrived for sampling at local Arrived for sampling at local Arrived for sampling at local Prepping coolers Working on shipping UPS Two (2) days pring the	Moving Forwa Weather for to GW Level Monitor	ard (Next Steps) D er History oring event	N/A	N/A	N/A Special Comments
w8 ear MW8 AF1 onday, Ja Previous Day week	Arrived for sampling at local Prepping coolers Working on shipping UPS Two (2) days pring pring 11, 2016	Moving Forwa Moving Forwa Weathe or to GW Level Monito	er History oring event	N/A	N/A	N/A Special Comments
ear MW8 AF1 onday, Ja Previous Day Week	Prepping coolers Working on shipping UPS Two (2) days pring ups Two (2) days pring ups	Moving Forwa Weathe or to GW Level Monito	er History oring event	N/A	N/A	N/A Special Comments
onday, Ja Previous Day Week	Working on shipping UPS Two (2) days price nuary 11, 2016	Weathe or to GW Level Monito	er History oring event	N/A	N/A	N/A Special Comments
onday, Ja Previous Day aily Week	Two (2) days pri nuary 11, 2016	Weathe or to GW Level Monito	er History oring event	N/A	N/A	N/A Special Comments
Previous Day	nuary 11, 2016	Weathe or to GW Level Monito	er History oring event	N/A	N/A	N/A Special Comments
Previous Day	nuary 11, 2016	or to GW Level Monito	er History oring event	N/A	N/A	N/A Special Comments
Previous Day	nuary 11, 2016	or to GW Level Monito	oring event			Special Comments
Previous Day	nuary 11, 2016	or to GW Level Monito	oring event	Next	Day »	<u> </u>
Previous Day	nuary 11, 2016		•	Next	Day »	<u> </u>
Previous Day		Actual	Average	Next	Day »	.,,,
mperature				Record		
Mean Tempera	ature	26 °C	26 °C			
Max Temperat	ture	28 °C	28 °C	33 °C [1982]		
Min Temperati	ure	24 °C	22 °C	16 °C [1965]		
gree Days						
		0	0			
		14				
		28 [Base 50]	173			
isture	The state of the s	- (
Dew Point		21 °C				
Average Humi	dity	78				
Maximum Hur	nidity	94				
Minimum Hum	idity	59				
ecipitation						
Precipitation		3.05 mm	3.30 mm	2.21 mm [1902]		
Month to date	precipitation		1.55			
Year to date p	recipitation		1.55			
He Mo Sin Co Mo Year Grown Ist De Ave Ma Min Pre	ee Days sating Degree onth to date note 1 July her oling Degree onth to date or to date or owing Degree ure ow Point erage Humi aximum Hum onth to date onth to date	onth to date heating degree days onth to date heating degree days once 1 July heating degree days onling Degree Days onth to date cooling degree days on to date cooling degree days owing Degree Days over to date cooling degree days owing Degree Days over to date cooling degree days over to date c	tee Days That ing Degree Days That ing Deg	tating Degree Days atting Degree Days onth to date heating degree days onth to date heating degree days onth to date cooling degree days onth to date cooling degree days art to date cooling degree days 28 (Base 50) ture 21 °C erage Humidity 78 eximum Humidity 94 inimum Humidity 59 inimum Humidity pitation article Days 3.05 mm 3.30 mm article Days 4.55	tating Degree Days onth to date heating degree days onth to date heating degree days once I July heating degree days onling Degree Days 14 13 onth to date cooling degree days onth to date cooling degree days ar to date cooling degree days ar to date cooling degree days are to date co	tating Degree Days onth to date heating degree days onth to date heating degree days once I July heating degree days only onth to date cooling degree days owing Degree Days 28 (Base 50) ure vw Point 21 °C erage Humidity 78 oximum Humidity 94 oximum Humidity 59 oximum Humidity 59 oximum Humidity oximum Humidity 3.30 mm 3.30 mm 2.21 mm (1902) onth to date precipitation



Daily Activities Report
Prepared by: CHES Services Corp. d/b/a: Fernando L. Rodríguez, PE & Associates
Chemical/Environmental Engineering & Industrial Hygiene Consultants
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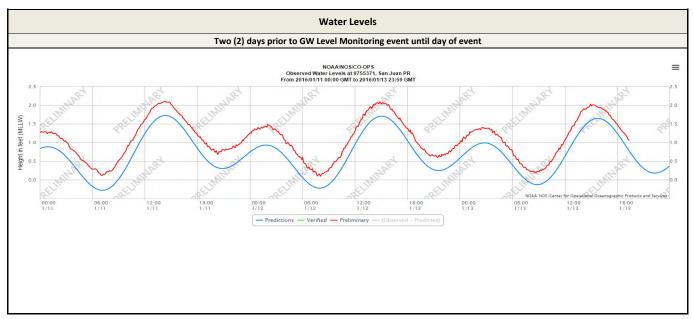
Project:	CAF MW Bimonthly Sampling Event				
Address:	LMMIA	Date:	January 13, 2015		

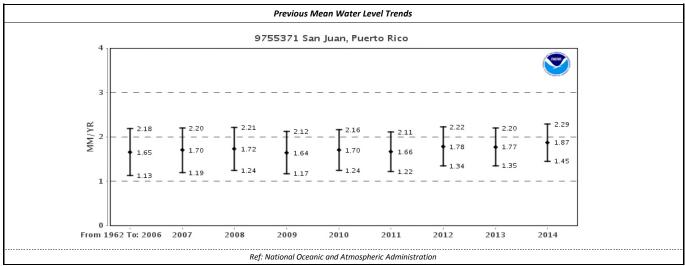




Daily Activities Report Prepared by: CHES Services Corp. d/b/a: Fernando L. Rodríguez, PE & Associates Chemical/Environmental Engineering & Industrial Hygiene Consultants www.firaches.com.

Project:	CAF MW Bimonthly Sampling Event					
Address:	LMMIA	Date:	January 13, 2015			







Daily Activities

Prepared by: CHES Services Corp. d/b/a: Fernando L. Rodríguez, PE & Associate:
Chemical/Environmental Engineering & Industrial Hygiene Consultant:
www.flraches.com.

Project:	CAF Groundwater Monitoring Wells					
Address:	LMMIA	Date:	January-16			

Weather History

Climatological Data for SAN JUAN L M MARIN AP, PR - January 2016

Click column heading to sort ascending, click again to sort descending.

Dest	Temperature			HDD	CDD	Donalaitestan	New Snow	Snow Depth	
Date	Maximum	Minimum	Average	Departure	нии	CDD	Precipitation	New Snow	Snow Depu
2016-01-01	83	73	78,0	0.1	0	13	0.02	0.0	0
2016-01-02	83	71	77,0	-0.9	0	12	T	0.0	0
2016-01-03	85	71	78.0	0.1	0	13	0.03	0.0	0
2016-01-04	87	72	79.5	1.7	0	15	0.04	0.0	0
2016-01-05	84	72	78.0	0.2	0	13	0.00	0.0	0
2016-01-06	84	74	79.0	1.2	0	14	0.30	0.0	0
2016-01-07	87	72	79.5	1.8	0	15	0.00	0.0	0
2016-01-08	85	74	79.5	1.8	0	15	0.00	0.0	0
2016-01-09	83	73	78.0	0.3	0	13	0.00	0.0	0
2016-01-10	84	75	79.5	1.8	0	15	0.00	0.0	0
2016-01-11	83	75	79.0	1.4	0	14	0.11	0.0	0
2016-01-12	83	72	77,5	-0.1	0	13	0.00	0.0	0
2016-01-13	83	73	78.0	0.4	0	13	0.00	0.0	0
2016-01-14	83	73	78.0	0.4	0	13	0.00	0.0	0
2016-01-15	85	71	78.0	0.5	0	13	T	0.0	0
2016-01-16	83	74	78,5	1.0	0	14	T	0.0	0
2016-01-17	85	73	79.0	1.5	0	14	0.00	0.0	0
2016-01-18	85	74	79.5	2.0	0	15	0.00	0.0	0
2016-01-19	84	74	79.0	1.5	0	14	0.19	0.0	0
2016-01-20	84	73	78,5	1.0	0	14	T	0.0	0
2016-01-21	85	72	78,5	1.0	0	14	0.01	0.0	0
2016-01-22	85	72	78,5	1.0	0	14	0.03	0.0	0
2016-01-23	86	73	79.5	2.0	0	15	0.00	0.0	0
2016-01-24	87	74	80.5	3.0	0	16	0.00	0.0	0
2016-01-25	82	74	78.0	0.5	0	13	0.18	0.0	0
2016-01-26	83	72	77,5	0.0	0	13	0.26	0.0	0
2016-01-27	85	73	79.0	1.5	0	14	0.00	0.0	0
2016-01-28	86	73	79.5	2.0	0	15	0.05	0.0	0
2016-01-29	88	72	80.0	2.5	0	15	0.00	0.0	0
2016-01-30	83	73	78.0	0.5	0	13	0.34	0.0	0
2016-01-31	84	73	78,5	1.0	0	14	0.04	0.0	0
Sum	2617	2260	-	-	0	431	1.60	0.0	-
Average	84.4	72,9	78,7	1.1	-	-	-	-	0.0
Normal	83.2	72.0	77,6	-	0	391	3.76	0.0	

Ref: NOAA NWSF; NOWData - NOAA Online Weather Dat; San Juan LMMIA Statioi



Daily Activities Report Prepared by: CHES Services Corp. d/b/a: Fernando L. Rodríguez, PE & Associates Chemical/Environmental Engineering & Industrial Hygiene Consultants www.firaches.com.

Project:	CAF MW Weekly Groundwater levels reading					
Address:	LMMIA	Date:	February 18, 2016			

	1		T	T				
Phone:	787-751-7810		CHES Representative:	NDM				
Time	Location		Activity / Observations					
7:30	CAF1	CHES representative	CHES representative arrived winth J&S personnel					
7:48	MW3	Arrived for levels rea	adings.					
8:00	MW5	Arrived for levels rea	adings.					
8:07	MW5	Done						
8:09	MW7	Arrived for levels rea	adings.					
8:15	MW7	Done						
8:16	MW9	Arrived for levels rea	adings and the wells are block	ked with UPS car.				
8:26	MW9	Done						
8:28	MW10	Arrived for levels rea	adings.					
8:34	MW10	Done						
8:36	MW11	Arrived for levels readings.						
8:42	MW11	Done						
8:48	MW6	Arrived for levels readings.						
8:53	MW6	Done	Done					
9:04	MW1	Arrived for levels rea	adings.					
9:09	MW1	Done						
9:11	MW4	Arrived for levels rea	adings.					
9:15	MW4	Done						
9:16	MW2	Arrived for levels rea	adings.					
9:20	MW2	Done						
9:24	MW8	Arrived for levels readings.						
9:27	MW8	Done						
9:35	CAF1	AF1 CHES and J&S Personnel Checked out						
			Moving Forward (Next Steps)				
Action Item				Deadline	%Completion	Responsible Party		
N/A				N/A	N/A	N/A		

 $\label{eq:file_point_point} \mbox{File Name: GW Levels \& Bimonthly Sampling Daily Activities Forms FOIA}$ Tab Name: 2016.02.18 GW Level

Prepared by: CHES Services Corp. d/b/a: Fernando L. Rodríguez Associates 2015



Daily Activities Report Prepared by: CHES Services Corp. d/b/a: Fernando L. Rodríguez, PE & Associates Chemical/Environmental Engineering & Industrial Hygiene Consultants www.firaches.com.

Project:	CAF MW Weekly Groundwater levels reading					
Address:	LMMIA	Date:	February 18, 2016			

Weather History						
Two (2) days prior to GW Level Monitoring event						
Tues	day, Februa	rv 16. 2016				
	vious Day	,,			Next Day »	
Daily		nthly Custom				
			Actual	Average	Record	
Tempe	rature					
Mea	n Temperature		26 °C	26 °C		
Max	Temperature		30 °C	29 °C	32 °C [1991]	
Min	Temperature		22 °C	22 °C	17 °C [1962]	
Degree	Days					
Hea	Heating Degree Days		0	0		
Mor	Month to date heating degree days		0	О		
Sino	ce 1 July heating degr	ee days	0	0		
Coo	ling Degree Days		14	13		
Mor	nth to date cooling d	egree days	221	208		
Yea	r to date cooling deg	ree days	652	599		
Gro	wing Degree Days		30 (Base 50)			
Moistu	re					
Dev	Point		21 °C			
Ave	rage Humidity		73			
Max	kimum Humidity		87			
Min	imum Humidity		59			
Precipi	tation					
Pre	cipitation		0.76 mm	2.29 mm	3.17 mm [1989]	
Mor	nth to date precipitat	ion	3.15	1.46		
Yea	r to date precipitatio	n	4.75	5.22		
			Ref: Weathe	r Underground		

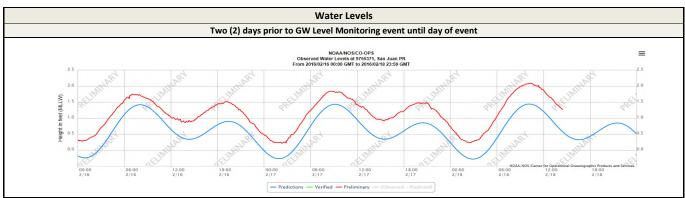
	Weather Hi	story		
One (1) day prior to GW I	Level Monitoring	event		Special Commer
Wednesday, February 17, 2016	N/A			
« Previous Day			Next Day »	
Daily Weekly Monthly Custom				
	Actual	Average	Record	
Temperature				
Mean Temperature	27 °C	26 °C		
Max Temperature	29 °C	29 °C	33 °C [1983]	
Min Temperature	23 °C	22 °C	16 °C [1962]	
Degree Days				
Heating Degree Days	0	0		
Month to date heating degree days	0	0		
Since 1 July heating degree days	0	0		
Cooling Degree Days	15	13		
Month to date cooling degree days	236	221		
Year to date cooling degree days	667	612		
Growing Degree Days	28 [Base 50]			
Moisture				
Dew Point	22 °C			
Average Humidity	79			
Maximum Humidity	88			
Minimum Humidity	69			
Precipitation				
Precipitation	2.29 mm	2.03 mm	5.41 mm [1989]	
Month to date precipitation	3.24	1.54		
Year to date precipitation	4.84	5.30		

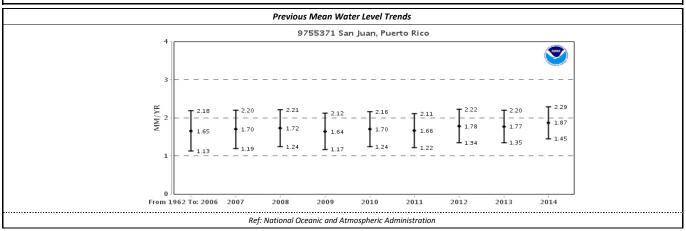


Daily Activities Report Prepared by: CHES Services Corp. d/b/a: Fernando L. Rodríguez, PE & Associates Chemicol/Environmental Engineering & Industrial Hygiene Consultants www.firaches.com.

Project: CAF MW Weekly Groundwater levels reading Address: LMMIA Date: February 18, 2016

	Weather	History		
Day of GW Leve	el Monitoring eve	nt		Special Comment
Thursday, February 18, 2016				N/A
« Previous Day			Next Day »	
Daily Weekly Monthly Custom				
	Actual	Average	Record	
Temperature				
Mean Temperature	24 °C	26 °C		
Max Temperature	27 °C	29 °C	32 °C [1983]	
Min Temperature	23 °C	22 °C	17 °C [1962]	
Degree Days				
Heating Degree Days	0	0		
Month to date heating degree days		0		
Since 1 July heating degree days		0		
Cooling Degree Days	12	13		
Month to date cooling degree days		234		
Year to date cooling degree days		625		
Growing Degree Days	27 (Base 50)			
Moisture				
Dew Point	22 °C			
Average Humidity	82			
Maximum Humidity	87			
Minimum Humidity	72			
Precipitation				
Precipitation	0.0 mm	2.03 mm	1.65 mm [1991]	
Month to date precipitation		1.62		
Year to date precipitation		5.38		







Daily Activities

Prepared by: CHES Services Corp. d/b/a: Fernando L. Rodríguez, PE & Associate:
Chemical/Environmental Engineering & Industrial Hygiene Consultant:
www.flraches.com.

Project:	CAF Groundwater Monitoring Wells				
Address:	LMMIA	Date:	February-16		

Weather History

Climatological Data for SAN JUAN L M MARIN AP, PR - February 2016

Click column heading to sort ascending, click again to sort descending.

D-4-		Temper	rature		HDD	CDD	Description	N C	Coron Donale
Date	Maximum	Minimum	Average	Departure	HDD	CDD	Precipitation	New Snow	Snow Depth
2016-02-01	86	73	79.5	2.0	0	15	0.00	0.0	0
2016-02-02	84	73	78.5	1.0	0	14	0.00	0.0	0
2016-02-03	83	72	77.5	-0.1	0	13	0.15	0.0	0
2016-02-04	83	73	78.0	0.4	0	13	0.02	0.0	0
2016-02-05	83	71	77.0	-0.6	0	12	0.61	0.0	0
2016-02-06	87	70	78.5	0.9	0	14	0.19	0.0	0
2016-02-07	85	70	77.5	-0.1	0	13	0.40	0.0	0
2016-02-08	87	73	80.0	2,3	0	15	0.00	0.0	0
2016-02-09	86	74	80.0	2,3	0	15	0.00	0.0	0
2016-02-10	87	74	80.5	2,8	0	16	0.00	0.0	0
2016-02-11	85	73	79.0	1.3	0	14	0.01	0.0	0
2016-02-12	83	72	77.5	-0.3	0	13	0.14	0.0	0
2016-02-13	85	73	79.0	1,2	0	14	0.00	0.0	0
2016-02-14	83	72	77.5	-0.3	0	13	0.68	0.0	0
2016-02-15	84	71	77.5	-0.3	0	13	0.92	0.0	0
2016-02-16	86	72	79.0	1,1	0	14	0.03	0.0	0
2016-02-17	85	74	79.5	1,6	0	15	0.09	0.0	0
2016-02-18	87	75	81.0	3.1	0	16	0.00	0.0	0
2016-02-19	84	74	79.0	1.0	0	14	0.14	0.0	0
2016-02-20	83	72	77.5	-0.5	0	13	0.07	0.0	0
2016-02-21	85	75	80.0	2.0	0	15	0.13	0.0	0
2016-02-22	87	73	80.0	1.9	0	15	T	0.0	0
2016-02-23	87	74	80.5	2,4	0	16	T	0.0	0
2016-02-24	86	75	80.5	2,4	0	16	0.00	0.0	0
2016-02-25	86	73	79.5	1,3	0	15	0.00	0.0	0
2016-02-26	86	75	80.5	2,3	0	16	T	0.0	0
2016-02-27	85	71	78.0	-0.2	0	13	0.00	0.0	0
2016-02-28	82	73	77.5	-0.8	0	13	0.30	0.0	0
2016-02-29	84	73	78.5	0.2	0	14	0.00	0.0	0
Sum	2464	2113	-	-	0	412	3.88	0.0	-
Average	85.0	72.9	78.9	1,0	-	-	-	-	0.0
Normal	83.7	72.0	77.9	-	0	360	2.39	0.0	-

Ref: NOAA NWSF; NOWData - NOAA Online Weather Dat; San Juan LMMIA Statioi



Fifth Bimonthly Report

Groundwater Monitoring Wells at the Luis Muñoz Marin International Airport (LMMIA)

3.0 GROUNDWATER LEVELS DATABASE

The following groundwater levels database includes data corresponding to the twenty-two (22) wells installed at the LMMIA.



Groundwater Monitoring Wells Construction and Sampling Project



Groundwater (GW) Level Readings

GW Level Monitoring Start: May 18, 2015 GW Level Readings To-Date: February 23, 2016

Well ID	MW1S	MW1D	MW2S	MW2D	MW3S	MW3D	MW4S	MW4D	MW5S	MW5D	MW6S	MW6D	MW7S	MW7D	MW8S	MW8D	MW9S	MW9D	MW10S	MW10D	MW11S	MW11D
Top of Casing Elevation (feet)	9.33	9.96	12.00	11.86	11.42	10.45	8.39	7.51	10.18	13.22	7.09	8.93	10.82	8.05	9.69	10.95	12.71	11.30	9.57	10.16	9.39	9.09
Well depth (feet)	10	20.5	10	20	10	20	10	20.5	10	20	10	20.5	10	20.5	10	20.5	10	20.5	10	20.5	12	23.5
Week of May 18, 2015	6.25	6.33	4.58	4.33	6.33	6.40	3.42	2.67	6.75	8.67	6.25	6.33	6.00	6.50	2.67	3.00	7.00	7.58	6.75	6.75	6.25	9.00
	6.00	6.00	4.08		6.40	6.50	2.92	2.92		6.84		6.50	5.92	6.92	3.00	3.08	6.92	7.16	6.50	6.68	7.16	7.00
May 25, 2015				4.00					NR		5.84											
June 1, 2015	6.25	6.40	4.00	3.50	6.25	6.16	3.00	3.00	6.00	6.67	5.50	6.00	5.67	6.08	2.67	2.16	5.40	7.00	6.25	6.25	6.58	7.00
June 8, 2015	5.75	5.92	4.08	3.84	7.00	7.00	3.00	3.25	6.92	7.08	6.25	6.50	6.08	4.25	2.92	3.50	6.50	7.08	7.00	6.84	7.25	7.50
June 15, 2015	5.92	5.62	4.00	3.50	6.33	6.25	3.16	2.92	6.92	6.40	5.50	6.00	5.58	4.08	2.92	3.00	5.92	6.50	6.33	6.33	7.00	7.00
June 22, 2015	6.00	6.33	4.33	4.08	6.75	6.84	3.33	3.25	6.75	6.92	6.16	6.33	6.08	5.00	3.00	3.33	5.84	6.58	6.84	6.75	7.50	7.40
June 29, 2015	5.92	6.25	4.33	4.08	6.58	6.75	3.25	3.16	6.75	6.92	6.16	6.40	6.08	6.33	3.00	3.33	5.84	6.50	6.75	6.75	7.16	7.25
July 6, 2015	5.84	6.25	4.25	4.00	6.84	6.75	3.33	3.16	6.84	6.84	6.16	6.33	6.05	6.25	3.00	3.33	5.84	6.33	6.75	6.75	7.58	7.25
July 13, 2015	6.00	6.16	4.16	3.92	6.50	6.75	3.25	3.16	6.75	6.84	6.16	6.33	6.08	6.33	2.92	3.25	6.25	6.58	6.58	6.58	7.00	7.25
July 20, 2015	6.00	6.33	4.16	4.00	6.58	6.75	3.25	3.16	6.58	6.84	6.08	6.33	6.00	6.33	3.00	3.25	6.16	6.58	6.58	6.58	7.25	7.33
July 27, 2015	6.00	6.16	4.33	4.00	6.58	6.67	3.33	3.08	6.75	6.75	6.16	6.25	6.00	7.58	3.08	3.40	6.08	6.25	6.58	6.58	7.67	7.50
August 3, 2015	6.08	6.16	4.16	4.00	6.67	6.75	3.33	3.16	6.58	6.84	6.40	6.33	6.16	7.25	3.08	3.33	6.84	6.16	6.67	6.84	7.75	7.58
August 10, 2015	6.08	6.08	4.16	3.75	6.50	6.58	3.00	3.00	6.58	6.75	6.58	6.08	6.00	6.16	3.00	3.16	5.75	6.16	6.50	6.50	7.50	7.50
August 17, 2015	6.00	5.84	3.84	4.08	6.67	6.58	3.00	3.08	6.58	6.67	6.08	6.08	5.92	6.16	2.84	3.00	5.50	6.00	6.25	6.33	6.67	6.92
August 24, 2015	6.00	6.00	4.08	3.75	6.42	6.50	3.00	2.92	6.42	6.67	6.00	6.08	5.84	6.00	2.58	3.00	5.42	5.75	6.16	6.25	6.42	6.67
September 14, 2015	6.00	6.00	4.00	3.75	6.16	6.42	3.08	3.00	6.42	6.58	5.75	6.00	5.75	6.00	2.75	2.92	5.50	5.58	6.25	6.08	6.58	6.67
October 12, 2015	5.84	5.92	4.08	3.84	6.50	6.42	3.08	3.00	6.50	6.58	5.92	6.08	5.84	6.16	2.84	3.08	5.75	5.84	6.42	6.33	7.16	7.08
November 9, 2015	5.58	5.84	3.16	3.50	6.25	6.16	2.92	3.00	6.50	6.50	5.08	5.84	5.67	6.08	2.50	2.67	5.00	6.08	5.84	5.75	4.16	5.84
December 14, 2015	5.75	6.08	4.08	3.84	6.50	6.50	3.08	3.33	6.25	7.08	5.08	6.00	5.67	9.92	2.67	3.84	5.25	5.25	6.25	6.33	6.58	6.50
January 11, 2016	5.83	6.08	4.00	3.75	6.78	6.78	4.00	3.75	6.50	6.92	5.75	6.08	5.83	6.00	2.75	3.00	6.00	5.42	6.42	6.33	6.83	6.75
February 18, 2016	5.75	6.75	4.17	3.75	6.50	6.50	3.33	3.58	6.33	7.17	6.08	6.08	5.75	7.33	2.75	3.00	5.75	5.92	6.50	6.33	6.33	7.50

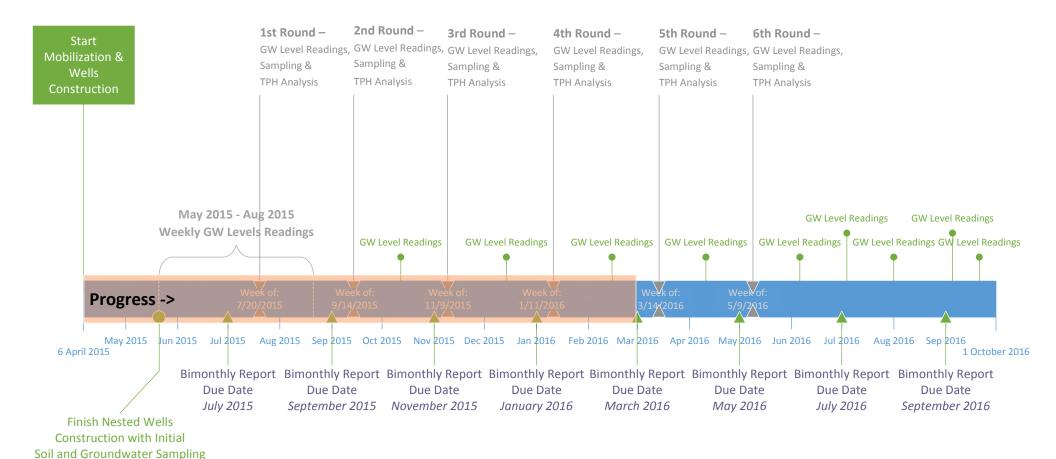


Fifth Bimonthly Report

Groundwater Monitoring Wells at the Luis Muñoz Marin International Airport (LMMIA)

4.0 PROJECT PROGRESS AND/OR PROPOSED SCHEDULE

The following pages provide project progress details and an updated proposed schedule for the tasks agreed upon with U.S. EPA.



Rev.: February 29, 2016

Caribbean Airport Facilities, Inc.

LMMIA, Carolina, PR

Eleven (11) Nested Groundwater Monitoring Wells

Construction with Bimonthly

Sampling/Analysis Timeline

Notes:

- 1. During the months of April and May 2015, groundwater (GW) and soil samples were collected at each one of the nested wells as they were constructed.
- 2. The following 3-month period, on a weekly basis, GW levels (shallow and deep) are being logged, and monthly thereafter.
- 3. After the initial sampling, the nested wells are to be sampled and samples to be analyzed for TPH analysis by the designated laboratory on a bimonthly basis (every 2 months) for the first year.
- M. LaReau (EPA): After sampling and water level measurements have commenced, CAF can make a recommendation based on the data to alter this schedule. At that time, EPA will review all documents presented to determine if a change is warranted.



Fifth Bimonthly Report

Groundwater Monitoring Wells at the Luis Muñoz Marin International Airport (LMMIA)

5.0 REFERENCES

- 1 Weather Underground. Historical Weather. [Internet]. 2015 Available from: http://www.wunderground.com/history/.
- 2 Center for Operational Oceanographic Products and Services. Observed Tides/Water Levels at 9755371, San Juan, PR. [Internet]. Available from: http://tidesandcurrents.noaa.gov/waterlevels.html.

DATA VALIDATION REPORT FOR THE JANUARY, 2016 DATA COLLECTION EVENTS PERFORMED AT

CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Prepared for

Eng. Fernando Rodríguez
Fernando L. Rodríguez, P.E. & Associates

February, 2016

Prepared by

Rafael Infante Environmental Consultant Chemist License 1888

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INTRODUCTION

The purpose of the independent data validation process for the Caribbean Airport Facility (CAF) GW well construction project is to assess the effect of the overall analytical process on the usability of the data. The validation process includes the verification and interpretation of analytical data, which provides the end user with a more complete understanding of the quality and defensibility of the laboratory data. The two major categories of data evaluation are laboratory performance and matrix interferences. Evaluation of laboratory performance is a check for compliance with the analytical methods and regulatory requirements; either the laboratory did, or did not, analyze the samples within the limits of the established analytical method. Evaluation of matrix interferences is more subtle and involves the analysis of several areas of results including surrogate spike recoveries, matrix spike recoveries, and reproducibility of duplicate sample results.

After the final analytical results were released by the laboratory, both the sample and QC data were carefully reviewed to verify sample identity, instrument calibration, detection limits, dilution factors, numerical computations, accuracy of transcriptions, and chemical interpretations. Additionally, the QC data were reviewed to ascertain whether they were within the laboratory-defined limits for accuracy and precision. Any non-conforming data were discussed in the laboratory's data package case narrative. Additional non-conforming (qualified or rejected data) form part of this report.

The sample results were assessed according to USEPA data validation guidance documents:

- USEPA Region 2, SOP HW-24, Standard Operating Procedure for the Validation of Organic Data Acquired using SW-846 Method 8260B (August, 2009-Revision 2), the USEPA National Functional Guidelines for Low/Medium Concentration Organic Data Review (SOW SOM01.2 SOP HW-33, August 2009 Revision 2), the USEPA National Functional Guidelines for Organic Data Review for Low Concentration Water (SOP HW-13, August, 2009-Revision 3) is used as a primary guidance document. Also, QC criteria from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8021B are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.
- Data Validation Standard Operating Procedure for Organic Analysis of Low/Medium Concentration Semivolatile Acquired using SW-846 Method 8270C (SOW SOM01.2-SOP HW-35, August 2009 Revision 1); Validation Semivolatile Organic Compounds by SW846 8270 (SOP HW-22, August, 2009 Revision 4). Also, the QC criteria from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8015C are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

Sample copies of the Data Review Worksheets utilized for the validation process are included in Appendix B. Completed data validation checklist and raw data are kept on our files. The following USEPA primary flags were used to qualify the data for this study:

- (No Code) = Confirmed Identification.
- B = Detected substantially above the level reported in laboratory or field blank.
- R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
- \bullet N = Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling events.
- J = Analyte present. Reported value may not be accurate or precise.
- K = Analyte present. Reported value may be biased high. Actual value is expected lower.
- L = Analyte present. Reported value may be biased low. Actual value is expected higher.
- UL = Not detected, quantitation limit is probably higher.
- Q = No analytical result.
- NJ = Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.
- U = The analyte was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
- \bullet R = The data are unusable. Analyte may or may not be present in the sample.
- UJ = The analyte was analyzed for, but not detected. The associated detection limit is an estimate and may be inaccurate or imprecise.
- X = Surrogate recovery outside control limits.
- H = Sample extracted or analyzed outside the method specific holding time

II. VALIDATION REPORT

This report discusses the results of data validation of analytical data provided by Eurofins-Lancaster Laboratories Environmental for samples collected at the Caribbean Airport Facility (CAF) in Carolina, Puerto Rico on January 12 and 13, 2016 reported under SDG numbers: 1623189 and 1623732. Copies of the laboratory results are included in the Appendix A. The methods employed are shown in Table 1. Table 2 summarizes the samples collected, sampling date, and analysis performed.

Table 1. Analytical Methods

ANALYSIS PERFORMED	ANALYTICAL METHOD
AQUEOUS	
TPH- GASOLINE (C6 – C10)	SW846-5030B/SW846-8015B
TPH-DIESEL (C10 – C28)	SW846-3510C/SW846-8015B

Table 2. Samples Analyzed, Sampling Date, and Analysis Performed

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLING DATE	ANALYSIS
8204475	MW11D-W01	01-12-16	TPH-GRO; TPH DRO
8204476	MW11S-W01	01-12-16	TPH-GRO; TPH-DRO
8204477	MW10D-W01	01-12-16	TPH-GRO; TPH-DRO
8204478	MW10S-W01	01-12-16	TPH-GRO; TPH DRO
8204479	MW6S-W01	01-12-16	TPH-GRO; TPH-DRO
8204480	FIELD BLANK GRAB WATER	01-12-16	TPH-GRO; TPH-DRO
8204481	EQUIPMENT BLANK GRAB WATER	01-12-16	TPH-GRO; TPH DRO
8204482	MW3S-W01	01-12-16	TPH-GRO; TPH-DRO
8204483	MW3S-W01MS	01-12-16	TPH-GRO; TPH-DRO
8204484	MW3S-W01MSD	01-12-16	TPH-GRO; TPH-DRO
8204485	MW9D-W01	01-12-16	TPH-GRO; TPH-DRO
8204486	MW-9S-W01	01-12-16	TPH-GRO; TPH-DRO
8204487	MW5D-W01	01-12-16	TPH-GRO; TPH DRO
8204488	MW5D-W01D	01-12-16	TPH-GRO; TPH-DRO
8204489	MW5S-W01	01-12-16	TPH-GRO; TPH-DRO
8204490	MW7D-W01	01-12-16	TPH-GRO; TPH DRO
8204491	MW7S-W01	01-12-16	TPH-GRO; TPH-DRO
8204492	MW6D-W01	01-12-16	TPH-GRO; TPH-DRO
8204493	MW6S-W01	01-12-16	TPH-GRO; TPH DRO
8204494	MW3D-W01	01-12-16	TPH-GRO; TPH DRO
8204495	TRIP BLANK WATER	12-18-15	TPH-GRO
8207313	MW4D-W01	01-13-16	TPH-GRO; TPH-DRO
8207314	MW4S-W01	01-13-16	TPH-GRO; TPH DRO
8207315	MW2D-W01	01-13-16	TPH-GRO; TPH DRO
8207316	MW2S-W01	01-13-16	TPH-GRO; TPH DRO
8207317	MW1S-W01	01-13-16	TPH-GRO; TPH-GRO
8207318	MW1D-W01	01-13-16	TPH-GRO; TPH-DRO

Table 2. Samples Analyzed, Sampling Date, and Analysis Performed

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLING DATE	ANALYSIS
8207319	MW8D-W01	01-13-16	TPH-GRO; TPH DRO
8207320	MW8S-W01	01-13-16	TPH-GRO; TPH-DRO
8207321	MW8S-W01 MS	01-13-16	TPH-GRO; TPH-DRO
8207322	MW8S-W01 MSD	01-13-16	TPH-GRO; TPH-DRO
8207323	EQUIPMENT BLANK COMPOSITE WATER	01-13-16	TPH-GRO; TPH-DRO
8207324	FIELD BLANK COMPOSITE WATER	01-13-16	TPH-GRO; TPH-DRO
8207325	TRIP BLANK WATER	01-13-16	TPH-GRO

The samples results were evaluated using general guidelines for data validation approved by local (PR Environmental Quality Board (EQB)) and national (Environmental Protection Agency (EPA)). General qualifiers were employed. The are no analytical and quality issues observed in the data package are shown in Table 3.

Table 3. Analytical and quality issues.

Laboratory Sample ID	Client ID	Sampling Date	Sample Type	Method	Analyte	Qualifier	Comment
160160015A	LCS	01/20/16	LCS	8015B	DRO	J	LCS – % recovery > lower laboratory control limits; results qualified as estimated (J) in samples 8204475 to 8204495. Professional judgment.
8204483	MW3S-W01MS	01/12/16	MS	8015B	DRO	J	MS/MSD outside
8204484	MW3S-W01 MSD	01/12/16	MSD	8015B	GRO	1	laboratory control limits; results qualified as estimated (J) in samples 8204475 to 8204495.
8204481	EQUIPMENT BLANK GRAB WATER	01/12/16	EB	8015B	DRO	-	DRO concentration in equipment blank 190 ug/L < 5 x SQL. No action taken for samples in the batch.
8207323	EQUIPMENT BLANK COMPOSITE WATER	01/13/16	FB	8015B	DRO	-	DRO concentration in equipment blank 190 ug/L < 5 x SQL. No action taken for samples in the batch.

Note: Laboratory results are assessed based on accuracy and precision. Accuracy is the difference between experimental value and true value. In environmental samples, true values are not known and thus accuracy is evaluated indirectly. Accuracy evaluation is performed by evaluating surrogate recoveries, analysis of matrix spike/matrix spike duplicates, and laboratory control samples. Accuracy was assessed using laboratory

control samples (LCS); matrix spike and matrix spike duplicate recovery results. Precision was assessed by evaluating results of laboratory and field duplicates.

Certification

The samples described in Table 2 were analyzed following standard procedures accepted by regulatory agencies. The quality control requirements met the methods criteria except in the occasions described in this document. The overall quality of the data is acceptable. Some of the results were qualified (J) by the laboratory and by the data validator, none of the results were rejected (R). The results are valid and can be used for decision taking purposes.

Rafael Infan

Mêndez LIC. # 1888

Rafael Infante

Licensed Chemist

Chemist License 1888

APPENDIA

Analysis Report

Caribbean Airport racility



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW11D-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204475

LL Group # 1623189 Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 12/2016 08:04 by DJP

Caribbean Airport Facilities

Suite 3

150 Sector Central Cardina PR 00979

Submitted: 01 13/2016 10:00 Reported: 01/28/2016 12:50

MW11D

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Pactor
	latiles TPH-GRO water C6-C1	SW-84 6	8015B n.a.	ug/1 N O.	ug/l 20	ug/l 90	ā.
	roleum carbons	SW-846	8015B	ug/l	ug/1	ug/l	
0826 <i>9</i>	TPH-DRO water C10-C The recovery for a Spike(s) is outside Summary. The follow The sample was re-exting and the QC is a first trial. Simil	carget and the QC adwing corrected output and compliant	cceptancs limits ective action was outside the metho All results ar	as noted on the QC .akun disequired holding e reported from the	31	36	1

General Sample Comments

All QC is compliant unless otherwise nited. Please refer to the Quality Control Summary for overall QC performance data and associated samples

		Labora	tory Sa	ample Analysi	s Record		
CAT No.	Analysis Name	Method	Trial*	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01635	TPH-GRO water C6-C10	SW-844 80153	1	1601/B20A	01/19/2016 02:46	Marie D Bearendeiler	1
01146	GC VOA Water Prep	SW-84: 5030B	*	1601 BECA	01,19/2016 09 4 6	Maris 7	1
08263	TPH-DRO water C10-C28	SW-846 8015B	÷	160160015A	01/20/2016 17:50	Bearrende, les Christane E Dolman	1
07003	Extraction - DRO (Waters)	SW-846 35100	i	160160015A	01 18 2010 08 30	SEAULTY Y Van' oberar	ī



^{*} This limit was used in the evaluation of the final result

💸 eurofins

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW11S-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204476

LL Group # 1623189

Account

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 12/2016 08:13 by DJP

Submitted: 01/13/2016 10:00

Reported: 01/28/2016 12:50

Caribbean Airport Facilities

Suite

150 Sector Central Cardina PR 00979

MW11S

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit*	<pre>Dimit of Quantitation</pre>	Dilution Factor
	latiles TPH-GRC water C6-Cl0	SW-84 6	8015B n.a.	ug/l ស.២	ug/1 20	ug/1	÷
	troleum carbons	SW-846	8015B	ug/l	ug /1	ug/l	
08263	TPH-DRC water ClC-C The recovery for a Spike(s) is outside Summary. Sufficient analysis.	target and the QC ac	cceptance limits	as noted on the		ଧର	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Sample	Analysis	Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Pactor
01635	TPH-GRO water C6-010	SW-846 8015B	-	1601°B20A	01,1372814 03.13	Maile D Beathroperina	1
01146	GC VOA Water Prep	\$₩~848 \$0303	-	1601 B20A	01/19/2014 03:13		1.
08269	TPH-DRO water C10-C28	SW-845 8015B	ī.	160% (0015A	0.9 \ \$1 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Christian E Dolma	1
07003	Extraction - DRO (Waters)	EW-846 35100	· ·	160180015A	01/18/0016 08.30	Brasleji K Vantedvet	ĝ.



^{*} This limit was used in the evaluation of the final result



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW10D-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

Account

LL Sample # WW 8204477 LL Group # 1623189 # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling) Caribbean Aliport Facilities

Collected: 01 12/2016 08:50 PA DIB

Suite ?

150 Sector Central Cardina FR 90979

Submitted: 01 13/2016 10:00 Reported: 01/28/2016 12:50

W10D			Method Detection Limit*	Limit of Quantitation	Dilution Factor
AT Analysis Name	CAS Number	Result ug/l	ug/l	սց/1	1
	-846 8015B	ad\. a.b.	20	5°-	
1638 TPH-GRO Water Carolle		uq/l	ug/l	ug/l	
C becroiean	-846 8015B	4	31	97.6 1	ì
ydrocarbons JR268 TPH-DRO Water C10-C28 The recovery for a tary Spike(s) is outside the Summary. The followin The sample Was re-extr time and the QC is con first trial. Similar	g corrective action was acted outside the matho	s taken. Indicated bolding the management of the second of			

General Sample Comments

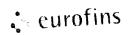
All QC is compliant unless otherwise noted. Plasse rafer to the Quality control Summary for overall QC performance data and associated samples

Laboratory Sample Analysis Record

Laboratory Sample Analysis Record							
CAT	Analysis Name	Method		Batch#	Analysis Date and Time	Analyst	Dilution Factor
ио. 0163£	TPH-GRO water C6-310	5W-846 80155	-	1001:B20A	01/15/2015 03:41	Marim D Beamenderfer	Ţ
01145	GC VOA Water Prep	8W-848 S030B	1000	1401 B20A	00/54 man# 083×40	Marie D Beurenderfei	Ţ
08245	TPH-DRO water C10-C28	2W-846 8015B		190120015A	01/10/2016 19:12	Christine E Dolman	: <u>:</u>
07003	Extraction - DRO (Waters)	3W-848 35100	-	A2100210A1	01/1 / 2019 08.3 0	Stauley W Vanieuver	1



^{*=}This limit was used in the evaluation of the final result



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 - 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW10S-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204478 LL Group # 1623189

Account

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 12/2016 08:57

by DJP

Caribbean Airport Pacilities

Suite 3

150 Sector Central Cardina FR 00979

Submitted: 01-13/2016 10:00 Reported: 01/28/2016 12:50

MW10S

W10S			Method Detection Limit*	Dimit of Quantitation	Dilution Factor
CAT Analysis Name	CAS Number	Result		ud/l	
٥.		ug/l	ug/l	-	1.
- v. l-tiles SW-8	46 8015B	-	20	5.51	
C Volatiles SW-8 1635 TPH-GRO Water C6-C10	n. 3.	N.D	ud/l	u g /1	
	346 8015B	ug/l	ug/ :		1
vdrocarbons		57 3	31	29.2	
TPH-DRO water ClC-C28 The recovery for a target Spike(s) is outside the (Summary. The following of The sample was re-extract time and the QC is complified first trial. Similar re	dorractive action was ted outside the metho	taken od required bolding on reported from the			

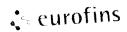
General Sample Comments

All QC is compliant unless otherwise noted. Please rafer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record								
CAT	Analysis Name	Method		Batch#	Analysis Date and Time	Analyse	Dilution Factor	
No.		SW+845 80182	u. Ala	1401.B20A	nsyde/3816 - 84.08	Marie D Bebronderier	1	
	GC VOA Water Prep	5W-845 S030B	1	14017 B 20A	W17 BUSDES OF THE	Mario D Bearranderie:	j	
	TPH-DRO water C10-C28	SW-846 8015B	-	160160015A	61/20/2016 00:52	Thristine E Dolman	1.	
	Extraction - DRO (Waters)	SW-846 35100	-	160160015A	01 32 7016 07 50	Stabley W God Hove	l	



^{*} This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 - 717-656-2300 - Fax: 717-656-2681 - www.LancasterLabs.com

Sample Description: MW6S-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204479 LL Group # 1623189

20530 Account

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling) Caribbean Airport Facilities

by DJP Collected: 01 12/2016 09:39

Suite i

150 Sector Central Cardina PR 00979 Submitted: 01 13/2016 10:00

Reported: 01/28/2016 12:50

MW6S-				Method Detection Limit*	Limit of Quantitation	Bilution Factor
CAT Analysis Name		CAS Number	Result		ug/2	
no.	SW-846		ug/ 1 N.D.	ug/l 20	5 <i>2</i>	Ţ
01638 CPH-GRO Water C6-		11. A.	ug/l	ug/l	ug/l	
GC Petroleum Hydrocarbons	SW-846	n,a.	120 J	31	94	1

The recovery for a target analyte(s) in the Laboratory Control 08269 TPH-DRO water C10-C28 Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

General Sample Comments

	Laboratory Sample Analysis Record						
CAT	Analysis Name	Method	Laboratory Sa Trial#		Analysis Date and Time	Analyst	Dilution Factor
No.	TPH-GRO water C6-C10	8W-846 801	- E55	16017 H20A	ht/19700.6 08-03	Morte D Bearenderfer	1
	GC VOA Water Prep	3W-845 593	3.28 -	1500 RuuA	MEAN ENGINEER OF THE PROPERTY OF	Sear endelle:	1
	TPH-DRO water C10-C28	SW-845 801	158 -	180190015A	01/20/0016 03 13	Christine E Dolman	
07003	Extraction - DRO (Waters)	sW-846 351	rac :	160169915A	91 10 2016 95:30	Harvey R Man enver	<u> </u>



^{*=} This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 + 717-656-2300 + Fax: 717-656-2681 + www.LancasterLabs.com

Sample Description: Field Blank Grab Water

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204480 LL Group # 1623189 # 20530 Account

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

by DJP Collected: 01,12/2016 07:37

through 01/12/2016 14:10 Submitted: 01 13/2016 10:00

Reported: 01/28/2016 12:50

Caribbean Airport Pacilities

Suite :

150 Sector Central Cardina PR 00979

MW6SF

MW6SF				Method Detection Limit*	Limit of Quantitation	Dilution Factor
CAT	and level of Mamo	CAS Number	Result	Defection name.		
No.	Analysis Name		ug/l	ug/l	ug/1	
GC Vo		8015B	N.O	20	<u> 5</u> 5	5
01635	TPH-GRC water C6-C10	11 . A .	(N + C)	. *	u q /1	
		6 8015B	ug/l	ug/l	-	Ţ.
Hydro 08269	carbons TPH-DRO water C1C-C28 The recovery for a target spike(s) is outside the QC summary. The following countries sample was re-extracted time and the QC is compliating trial. Similar resu	rective action was a outside the metho	s taken. od required colding va reported from the	30	ýS	

General Sample Comments

Laboratory Sample Analysis Record							
43.M	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
No.		SW-846 80165		1691 B29A	01/18/2016 33/33	Maria D Bearsaderier	1
	GC VOA Water Prep	SW-846 5034B	:	1401/B20A	65,15/2006 DS 33	Be toundellet	and the same of th
		EW-846 80155	**	160130 015A	01/20/2016 18:33	Christine E Dolman). ÷
	Extraction - DRG (Waters)	SW-846 35100	e e	16316001 5A	01 10 0016 de s0	Baladur√ † Yoma Mast/APT	1



^{*=}This limit was used in the evaluation of the final result



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Sample Description: Equipment Blank Grab Water

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204481 LL Group # 1623189

Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 12/2016 07:47 by DJP

Caribbean Airport Facilities

Suite 3

Submitted: 01 13/2016 10:00 Reported: 01/28/2016 12:50

150 Sector Central Cardina PR 00979

MW6SE

CAT Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
No.	SW-846 8015B	ug/1	ug/l	ug/l	
GC Volatiles S 01635 IPH-GRO water C6-C10	n.3.	N D	26	512	Å.
	SW-846 8015B	ug/l	ug/l	ug/l	
Spike(s) is outside t summary. The follow The sample was re-en	n.a. arget analyte(s) in the La the QC acceptance limits a ing corrective action was tracted outside the method ompliant. All results are r results were obtained in	caken i required holding reported from the	30	Я5	1

General Sample Comments

	Laboratory Sample Analysis Record							
CAT	Analysis Name	Method		Batch#	Analysis Date and Time	Analyst	Dilution Factor	
No. 01635	TPH-GRO water C6-C10	\$W-648 801 a∃	-	1601 B20A	01/15/2016 00:0:	Matie D Bearenderfex	1	
01146	GC VOA Water Prep	SW-844 503tB	:	1601-BUGA	00/ 9/2014 Jf.(1)	Bear enderiet	1	
08269	TPH-DRO water C10-C28	EW-846 8015B	1	1501:0015A	01/20/2016 23:55	Chilatine E Colman	1 1	
97003	Extraction - DRO (Waters)	SW-846 35100		140149015A	01,12°2016 98.39	Liaulo) Y Tan Angar	2	



^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW3S-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204482 LL Group # 1623189 # 20530 Account

> iael Infante Mendez

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 12/2016 10:20 by DJP

Caribbean Airport Facilities

Suite 7

150 Sector Central Cardina PR 00979

Submitted: 01 13/2016 10:00 Reported: 01/28/2016 12:50

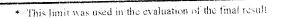
MW3S-

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
	.atiles TPH-GRO water C6-C1	SW-846	8015B	ug/l พ.D	ug/l 20	ug/2 90	J
	roleum	SW-846	8015B	ug/l	ug/l	ug/l	
Hydroc 08269	TPH-DRO water C10-C The recovery for a Spike(s) is outside Summary. The follo The sample was re-e time and the QC is first trial. Simil	target and the QC ad wing corr xtracted d	acceptance limits as ective action was outside the method All results are	noted on the go whom. required holding reported from the	30	크 4	1

General Sample Comments

Laboratory Samp	le	Analysis	Record
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CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
No. 01635	TPH-GRO water C6-319	SW-846 8015B	-	1601-B29A	Mg/19/0014 00:54	Marrie Fr Beamendesfer	1
01146	GC VOA Water Prep	EW-846 5030B	<u>.</u>	1601 B26A	74,7 53444	Bear enderler	1
08269	TPH-DRO water Cl0-C28	SM-844 8013B	· m	1601:0015 A	61,21/2016 18:55	Christine & Dolman	1
07003	Extraction - DRO 'Waters'	SW-846 35100	-	180180015 A	01:18:2003 02:59	Blacking * Venterment_	1





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Sample Description: MW3S-W01MS Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204483 LL Group # 1623189 Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 12/2016 10:22 by DJP

Caribbean Airport Facilities

Sunte :

Submitted: 01 13/2016 10:00 Reported: 01/28/2016 12:50 150 Sector Central Cardina PR 00979

MW3S-

CAT Analysis Name CAS Nu	mber Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
OC Volatiles SW-846 8015B 91635 TPH-GRO water C6-C10 n.a.	ug/1 1,200	ug/l 20	ug /1 90	
GC Petroleum SW-846 8015B	ug/l	ug/1	ug/3	
Hydrocarbons 08269 TPH-DRO water ClC-C28 n a. The recovery for a target analyte(s) in Spike(s) is outside the QC acceptance l Summary. The following corrective actions ample was re-extracted outside the time and the QC is compliant. All resultest trial. Similar results were obtained.	on was taken. method required holding lts are reported from The	31	9"	;

General Sample Comments

Laboratory S	Sample	Analysis	Record
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Laboracory Sample								
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor	
No. 01635	TPH-GRO water C6-Cl9	8W-846 8016B	1	1401-E20A	01/19/20 6 01:20	Beametiderier	J.	
01146	GC VOA Water Prep	SW-846 5030B	-	1401-B20A	01/12€/⊅0 H 0 H#3	Bearenderiel		
08269	TPH-DRO water C10-C28	SW-844 8015B		16013001 SA	01/00/2016 18:15			
07003	Extraction - DRO (Waters)	SW-846 35100		16016901 5A	01.10+2018 d3 39	di ulug 4 Viji agvar	ā.	



^{*=}This limit was used in the evaluation of the final result



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Sample Description: MW3S-W01MSD Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204484 LL Group # 1623189 Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 12/2016 10:24 by DJP

Caribbean Airport Facilities

Suite 3

Submitted: 01 13/2016 10:00 Reported: 01/28/2016 12:50

150 Sector Central Cardina PR 00979

MW3S-

CAT No.	Analysis Name	c	AS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Vol	atiles S	W-846 8015	3	ug/l	ug/l	ug/l	1
	TPH-GRG water C6-C10	n		1,299	2 მ	511 -	÷
GC Pet	roleum S	W-846 8015	В	ug/l	ug/l	ug/l	
Hydro c 08269	TPH-DRC water C10-C28 The recovery for a tal Spike(s) is outside th Summary. The following The sample was re-extinute and the QC is confirst trial. Similar	rget analyte(he QC accepta ng courective racted outsid mpliant. All	nce limits as action was d e the method results are	noted on the go aken required holding reported from the	31	g ^{ra}	1

General Sample Comments

All QC is compliant unless otherwise noted. Please befor to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
No. 0163∃	TPH-GRO water C6-C10	SW-846 80155	*	1601.E20A	01/19/20 K 01/51	Maria 0 Beamendelfer	1
01146	GC VOA Water Prep	SW-846 5030B	**	14017 B 20A		Belanende: Sex	1
08259	TPH-DRO water Cl0-C28	SW~846 8015B	-	16015001 5A	01/10/2016 19:38	Chalstine E Dolman	1
07003	Extraction - DRO (Waters)	SW-844 35100	*	140150015 A	01.13/2013 02:30	E2 33.25 d 7/av.1 40540	1



^{*-}This limit was used in the evaluation of the final result



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Sample Description: MW9D-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204485 LL Group # 1623189 Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01/12/2016 12:28 by DJP

Submitted: 01 13/2016 10:00

Reported: 01/28/2016 12:50

Dy Dok

Caribbean Airport Facilities

Suite 3

150 Sector Central Cardina PR 00979

MW9D-

CAT No.	Analysis Name		CAS Number	Result	Method Detection bimit*	Limit of Quantitation	Dilution Factor
GC Vo	latiles S	SW-846	8015B	ug/1	ug/l	ug/1	ē
	TPH-GRO water C6-C10		n. E.	N . D .	2ਰ	5·:	*
GC Pe	troleum	SW-846	8015B	ug/l	ug/l	ug/l	
Hydro c 98269	TPH-DRO water ClC-C28 The recovery for a tall Spike(s) is outside the Summary. The follow. The sample was re-extinge and the QC is offerst trial. Similar	arget and the QC acting correct tracted compliant	cceptance limits a active action was outside the method All results are	is noted on the go laken reported from the	7.3	95	1

General Sample Comments

Laboratory	Sample	Analysis	Record
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			-				
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	and - ,	Dilution Pactor
No. 01635	TPH-GRO water C6+C18	SW-845 80155	÷	1601 B20A	01/09/2014 05:31	Matra (Beatenderfer	1
01145	GC VOA Water Prep	SW-846 593CB	1	1601-B20A	Maria Maria	Bear endel Jer	2
08269	TPH-DRO water C10-C28	SW-846 8015B	2	1601-0015A	01/20/2018 23 56	Christine E Dolman	1
07003	Extraction - DRO (Waters)	9W-846 35100	* 180	160140015A	01,18 Wers ea 30	Bala allog i i ^{et} Monit entwer	ì





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Sample Description: MW9S-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204486 LL Group # 1623189

Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 12/2016 12:35

py DJr

Caribbean Airport Facilities

Suite ?

Submitted: 01 13/2016 10:00

150 Sector Central Cardina PR 00979

Reported: 01/28/2016 12:50

MW9S-

MW9S-		Method Detection Limit*	Limit of Quantitation	Dilution Pactor
CAT CAS No No. Analysis Name SW-846 8015B	ug/l	ug/l 20	ug/l 84	<u>E</u>
01635 TBH-GRO water C6-C10 H.A.	N.E: ug /l	ng/l	ug/l	
Hydrocarbons	860 2	30	भूवं	1
O8269 TPH-DRO water C10-C28 fl.a. The recovery for a target analyte(s) i spike(s) is outside the QC acceptance summary. Sufficient sample was not avanalysis.	limits as noted on the QC allable to receat the			

General Sample Comments

Laboratory Sample Analysis Record									
CAT	Analysis Name	Method		Batch#	Analysis Date and Time	Analyst	Dilution Factor		
No. 01635		5N-846 80155	2	1601 7B29A	g. 12/2016 65 58	Scarender191	ā.		
01145	GC VOA Water Prep	SW-846 \$030E	1	1601-B20A	agy19/0016 09:58	Waarehderler			
08269	TPH-DRO water C10-C28	.W-346 80153	i.	160140015A	hiver/pane (a) 66	Christine E Dolmar			
07003	Extraction - DRO (Waters)	9W-846 3510C	-	1601:0015A	01,19/0016 09:30	Bradley W VanLeuven	1		



^{*=} This limit was used in the evaluation of the final result



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Sample Description: MW5D-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204487

LL Group # 1623189 # 20530 Account

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling) Caribbean Airport Facilities

by DJP Collected: 01 12/2016 13:10

Suite 3

Submitted: 01 13/2016 10:00

150 Sector Central Cardina PR 00979

Reported: 01/28/2016 12:50

MW5D-

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Vol	atiles SW-84	6 8015B	ug/l N.D	ug/l 20	ug /1 50	<u>:</u>
GC Pet	croleum SW-84	16 8015B	u g /1	ug/l	ug/l	
Hydro c 0826 <i>9</i>	TPH-DRO water C1C-C28 The recovery for a target Spike(s) is outside the QC Summary. The following co The sample was re-extracte time and the QC is complia- first trial. Similar rest	<pre>! acceptance limits : prective action was ed outside the method art</pre>	taken d required holding e reported from the	30	94	1

General Sample Comments

	Laboratory Sample Analysis Record								
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor		
No. 01635	TPH-GRO water C6-C10	SW-846 8018B	Th.	1601-B20A	01,18/2016 - 04-24	Mar e D Bearenderier	1		
01146	GC VOA Water Prep	SW-846 5030B	- -	16017B20A	6171.87801 K 64.24	Beamenderfel	1		
08269	TPH-DRO water C10-C28	SW-845 8015B	~	1401:0015A	01/10/2018 19:59	Christine E Dolmar	1 1		
07003	Extraction - DRO (Waters)	5W-845 35100	È	1601400 15A	91/10/2016 UF.BC	Exauloji Y Vani egwer	ž		



^{*=}This limit was used in the evaluation of the final result



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Sample Description: MW5D-W01D Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204488 LL Group # 1623189 Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 12/2016 13:12 by DJP

Caribbean Airport Facilities
Suite 3

150 Sector Central

Submitted: 01 13/2016 10:00 Reported: 01/28/2016 12:50

Cardina PR 00979

MW5DD

CAT No.	Analysis Name	CAS	Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Vol	atiles TPH-GRO water C6-C10	SW-846 8015B		ug/l N.S	ug/l 20	ug /2 50	<u>.</u>
		sw-846 8015B		ug/l	ug/l	ug/l	
08269	TPH-DRO water C10-C2 The recovery for a tapike(s) is outside Summary. The follow The sample was re-entime and the QC is first trial. Simil.	target analyte(s) the QC acceptance wring corrective as xtracted outside to	in the Lab limits as tion was t the method esults are	noted on the _c aken: required holding reported from the	31	94	1

General Sample Comments

All QC is compliant unless otherwise nored. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Babblacoly benefit									
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor		
No. 0163₫	TPH-GRO water C6-C10	3W-845 80155	r. Fra	1601/B26A	01,19/2014 06:5:	Bearenderfer	1		
01146	GC VOA Water Prep	SW-846 5030B	į	1601 B20A	THE PART OF THE PA	Regrenderfel	3.		
08269	TPH-DRO water C10-C28	SW-846 8013B		16016001SA	01/21/2016 20:21	Christine & Dolman	i.		
07003	Extraction - DRO (Waters)	SW-846 35100	-	1501:001 5A	91. N.S 12378 - 33. 38	Basila a Logic (F 17,555) Basilasin	j.		
		SW-846 35100	~	1501:001 5A	01.13/2018 033.30	Rosolov P Mari Armen	, As		



^{*-}This limit was used in the evaluation of the final result



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Sample Description: MW5S-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204489 LL Group # 1623189 # 20530 Account

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling) Caribbean Airport Facilities

Collected: 01-12/2016 13:19 by DJP

Surte 3 150 Sector Central Cardina PR 00978

Submitted: 01 13/2016 10:00 Reported: 01/28/2016 12:50

MW5S-

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Vol	.atiles TPH-GRC water C6-Cl	SW-846 O	8015B n.a.	ug/l N.D.	ug/1 20	ug/ 1 90	1
GC Pet	roleum	SW-846	8015B	ug/l	ug/l	ug/1	
Hydrocarbons 08269 TPH-DRO water C10-C28 n.a. 150 J The recovery for a target analyte(s) in the Pacoratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken. The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.			31	94	1		

General Sample Comments

77	Laboratory Sample Analysis Record										
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor				
No. 016∃5	TPH-GRO water C6-010	SW-845 80155	2	1401-B20A	01/16/2014 07 21	Mar = 5 Bearlenderfer	1.				
01146	GC VOA Water Prep	SW-846 5030≌	1	1601-B29A	01/19/23/4 10 21	beamende fer	1				
08269	TPH-DRO water C10-C28	3W+846 8015B	-	180190015A	01/20/0016 20:40	Chenstine E Dolmai	1 I				
07003	Extraction - DRO (Waters)	5W-846 35100		1401:0015A	01:07:0906 00:00	las autori M Magni Augyan	1				



^{*-} This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW7D-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204490 LL Group # 1623189

Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 12/2016 13:58 by DJP

Caribbean Airport Facilities

Suite 3

Submitted: 01 13/2016 10:00 Reported: 01/28/2016 12:50

150 Sector Central Cardina PR 00979

MW7D-

CAT No.	Analysis Name	c	As Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Vol	L atiles IPH-GRO water C6-C1	sw-846 8015	. ä.	ug/l ક્રિલ		ug/1 20	ug/l 50	1
GC Pe	troleum	SW-846 8015	3	ug/l		ug/l	ug/l	
Hydro 08269	TPH-DRO water C10- The recovery for a Spike(s) is outsid Summary. The foll The sample was re- time and the QC is first trial. Simi	target analyte() e the QC acceptal owing corrective extracted outsid	action was action was e the method results are	s noced Laken regulre reporte	Control on the QC ed holding ed from the	32	ē.,	1

General Sample Comments

Laboratory	Sample	Analysis	Record
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		2000		-			
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
No. 0163€	TPH-GRO water C6-C19	SW-845 8013B	-	1401-B20A	91/13/2016 07:44	Beamenderfer	1
01146	GC VOA Water Prep	9W-846 5030B	1	1401/B≥9A	03/13/001F 07 98	Beauenderter	1
08259	TPH-DRO water Cl0-C28	SW-846 8015E		160160015 A	01/20/0008 00:39	Christine E Dolman	. 1
07003	Extraction - DRO (Waters)	SW-846 35100	2	160166015A	01-19-2016 - 67 58	Balduury M Vaniteiven	, ,



^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW7S-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204491 LL Group # 1623189

Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 12/2016 14:05 by DJP

Caribbean Arrport Facilities

Suite 3

Submitted: 01/13/2016 10:00 Reported: 01/28/2016 12:50 150 Sector Central Cardina PR 00979

MW7s-

CAT No.	Analysis Name		CAS Num	ber Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Vol	latiles	SW-846	8015B	ug/l	na/1	ug/1	
	TPH-GRO water C6-C1	.0	n.a.	N , D_{ℓ} ,	20	50	
GC Pet	troleum	SW-846	8015B	ug/1	ug/l	ug/1	
Hydro c 08269	Spike(s) is outside Summary. The follow The sample was re-	target ins the QC acoming corresected compliant	cceptance li ective action outside the All resul	180 3 the Laboratory Control mits as noted on the 20 n was taken, method required holding ts are reported from to ned in both trials.	3	94	1

General Sample Comments

	Laboratory Sample Analysis Record										
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor				
No. 01635	TPH-GRO water C6-C19	SW-845 80155	-	1601-B20A	01/19/2016 09:14	Mar e D Bearenderfer	1				
01145	GC VOA Water Prep	SW-846 5030B	<u>:</u>	1401/B20A	01/19/2014 08:1h	Bearlende: Sei	1				
08269	TPH-DRO water C10-C28	SW-846 8015B	*	140150015 A	01/21/2016 01:17	Christine E Dolmar	1 l				
07003	Extraction - DRO (Waters)	9W-846 35100	*	160140015A	01 18/2013 08 50	Education of Mathical Company	re di				



^{*=} This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW6D-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204492

LL Group # 1623189

Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 12/2016 09:30 by DJP

Caribbean Airport Facilities

Suite :

Submitted: 01:13/2016 10:00 Reported: 01/28/2016 12:50 150 Sector Central Cardina PR 00979

MW6D-

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
	latiles TPH-GRG water C6-C1	SW-846	8015B	ug/l N.D.	ug/l 20	ug/ l 50	e on
	troleum	SW-846	8015B	ug/1	ug/l	ug /1	
Hydro c 08269	TRH-DRO water Cl6-C The recovery for a Spike(s) is outside Summary. The follo The sample was re-e time and the QC is first trial. Simil	target and the QC a wing corrected wirected compliant	oceptance limits a ective action was outside the method All results are	s noted on the QC Laken required holding reported from the	31	žę.	1

General Sample Comments

	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor				
	TPH-GRO water C6-C10	SW-845 801EE	-	1691 B2GA	0171970016 0f-43	Maria D Bearmderfer	1				
01146	GC VOA Water Prep	SW-846 5030B	*	1401 BB0A	01/19/0016 09:43	Martell Beatenderfei	1				
08259	TPH-DRO water C10-C28	2W-846 8015B	-	16013991 5A	61/2012018 21:64	Christine E Dolman	1				
07003	Extraction - DRO (Waters)	SW-846 35100	į.	160100015A	01:12:201: d0.s4	Bankalut M	1.				



^{*-} This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 + 717-656-2300 + Fax: 717-656-2681 + www.LancasterLabs.com

Sample Description: MW6S-W01D Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204493 LL Group # 1623189 Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 12/2016 09:42 by DJP

Caribbean Airport Facilities

Suite 3

150 Sector Central Cardina PR 00979

Submitted: 01 33/2016 10:00 Reported: 01/23/2016 12:50

MW6SD

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
	.atiles IPH-GRO water C6-C1	sw-946 8 o	015B n.s.	ug/1 N D.	ug/l 20	ug/l 50	1
GC Pet	roleum	SW-846 8	015B	ug/l	ug /1	ug/l	
Hydrod 08263	TPH-DRO water C10-C The recovery for a Spike(s) is outside Summary. The follo The sample was rese time and the QC is first trial. Simil	target anal the QC accoming correct output the QC accoming correct output the Correct output the Correct output the Correct th	eptance limits as tive action was l tside the method All results are	aken required holding reported from the	31	94	l.

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

	Habotacor, Tariffer and A										
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor				
01145	TPH-GRO water C6-U10 GC VOA Water Prep TPH-DRO water C10-C28	SW-846 8916B SW-846 5036B SW-846 8016B		16018A20A 16018A20A 160180015A	01/29/2016 14:29 01/29/2016 18:29 01/29/2016 18:29	Jeremy C Giffin	1 1				
07003	Extraction - DRO (Waters)	SW-846 35190	÷	160160915 A	01/19/2018 08:30	Bradley W Vanleuven	1				



^{*} This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW3D-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204494 LL Group # 1623189

Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 12/2016 10:12 by DJP

Caribbean Airport Facilities

Suite ?

Submitted: 01 13/2016 10:00 Reported: 01/28/2016 12:50 150 Sector Central Cardina PR 00979

MW3D-

CAT No. Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Volatiles 01635 TPH-GRO water C6-C1	SW-846	8015B	ug/l N.O	ug/l 24	ug /1 50	ă
			ug/l	uq/1	u q /1	
GC Petroleum Hydrocarbons 08269 TPH-DRO water C10-O The recovery for a Spike(s) is outside Summary. The folio The sample was re-e time and the QC is first trial. Simil	cceptance limits ective action was outside the metho . All results ar	60 0 1 shoratory Control as noted on the QC Caken. d required holding a reported from the	30	94	1	

General Sample Comments

All QC is compliant unless otherwise usted. Please rater to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
0163E 01146	TPH-GRO water C6-C19 GC VOA Water Prep TPH-DRO water C10-C28	SW+846 8015B SW-846 503CB SW+846 8015B		16015A20A 16019A20A 160160015 A	01/18/20.4 14-56 01/19/2016 18:58 01/20/2014 01:40	Jerany Maiffill	1 1
07003	Extraction - DRO (Waters)	SW-846 35170	<u>-</u>	1601:0015A	01/13/2015 09:30	Bradley V VanLeuven	1



^{*-}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: Trip Blank Water

CAF GW Monitoring Well Construction Project

LL Sample # WW 8204495 LL Group # 1623189 Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 12 18/2015

Caribbean Airpoit Facilities

Suite ?

150 Sector Central Cardina PR 00979

Reported: 01/28/2016 12:50

Submitted: 01 13/2016 10:00

MW3DT

CAT No. Analysis Name	CAS Number	Result	Method Detection Limit*	Quantitation	Dilution Factor
GC Volatiles SW- 01635 TPH-GRO water C6-Cl0	-846 8015B n.a.	ug/l N.D.	ug/1 20	ug/ 2	7

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall 2C performance data and associated samples

			-	-			
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
No. 01635	TPH-GRO water C6-C10	5W-344 8015B	-	14014B20A	01/18/2016 19:0%	Marie D Beatinderiel	e de
01146	GC VOA Water Prep	≨%-84% 5030B	9	14014B20A	01/15/2015 18:05	Natue 1 Begrenderfer	1



^{*} This limit was used in the evaluation of the final result

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Client Fernando L. Rodríguez, PE & Associates			Matrix			322			
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Curofins Lancaster Laboratories Environmental		Accl. # 205.30	1	Group# 1623189		Sample # 8	Hine	Sample # 8204475-95		
Client Fernando Rodríguez PE & Associates			Matrix			Ana	yses R	Analyses Requested	For Lab Use Only	se Only
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Page 28 of 33

CUrofins Lancaster Laboratories		4	Acat.# 20530	Group#	(623189)	Sample #	I	56-514h228	Ī	
Client Fernando L Rodríguez, PE & Associates				Matrix			Analyses	Analyses Requested	For Lab Use Only	e Only
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Page 29 of 33

Reurofins Lancaster Laboratories Environmental		Acct. # 20530	O Group # 1623189	23189	Sample	8200	Semple # 8 201475-95	•	
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2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW4D-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8207313

LL Group # 1623732

Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 13/2016 07:47 by DJP

Caribbean Airport Facilities

Suite 3

Submitted: 01/14/2016 10:00 Reported: 01/25/2016 11:32

150 Sector Central Cardina PR 00979

CAF4D

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
	Matiles SW-846 TPH-GRO water C6-C10	8015B n.a.	ug/l N D.	ug/l 20	ug/l 50	
	croleum SW-846	8015B	ug/l	ug/l	ug /1	
08263	carbons TPH-DRG water C18-C28	n.a.	140	31	96	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
	TPH-GRO water C6-019	SW-845 8015B	~	16013A20A	01/19/2016 19:19	Jer=my C Poftin	1
	GC VOA Water Prep	SW-846 5030B	~	16018AD0A	01/10/2016 18.39		1
	TPH-DRO water Cl0-C28	SW-844 80155		1601344 03 ¥	01/21/2016 17:29	Chr stine E Dolman	1,)
07003	Extraction - DRO (Waters)	SW-844 351CC		160150009A	01,201201. 11-25	Denise I Trimby	1



^{*=}This limit was used in the evaluation of the final result



Submitted: 01.14/2016 10:00

Reported: 01/25/2016 11:32

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW4S-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8207314

LL Group # 1623732

Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 13/2016 07:55 by DJP

Caribbean Airport Facilities

Suite

150 Sector Central Cardina PR 00979

CAF4S

CAT No. Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Volatiles 01635 TPH-GRO water C6-C10 Reporting limits were rai		ug/l N.D	ug/1 103	ug/ % 26.7	
GC Petroleum Hydrocarbons 08269 TPH-DRC water C10-C2	SW-846 8015B	u g /1 4,700	ug/1 31	ug /1 95	i

General Sample Comments

		Labor	atory Sa	ample Analys	sis Record		
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01635	TPH-GRO water C6-C10	SW-844 8015B	4	14032B20A	01/21/2016 14:25	Jersty 7 Siffin	5
01145	GC VOA Water Prep	FW-844 5030B		TennoB20A	01/01/2011 14:25	Jer-ny I Hiffin	Ė,
98269	TPH-DRO water C10-C28	SW-846 89155	-	160120009 A	01,91 (2014 20:45	Chilstine & Dolman	. 1
97003	Extraction - DRO (Waters)	SW-844 35100	at	;en) Food9A	01/20/2019 11:25	Den te Crimby	3



^{*-}This limit was used in the evaluation of the final result



Submitted: 01 14/2016 10:00

Reported: 01/25/2016 11:32

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW2D-W01 Grab Groundwater

Groundwater LL Sample # WW 8207315

CAF GW Monitoring Well Construction Project

LL Group # 1623732 Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01/13/2016 08:27 by DJP

Caribbean Airport Facilities

Suite ?

150 Sector Central Cardina PR 00979

CAF2D

CAT No. Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Volatiles 01635 TPH-GRO water C6-C16	SW-846	8015B	ug/1 48 3	ug/l 20	ug /1 50	2
GC Petroleum Hydrocarbons	SW-846	8015B	ug/l	ug/l	ug/l	
08269 TPH-DRO water Clo-C	18	n.a.	220	31	96	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01635	TPH-GRO water C6-C10	SW-844 8015B		16018A20A	01/19/2014 19:14	Werery C Riffin	1
01145	GC VOA Water Prep	SW-846 5033B		16018A20A	01,13/201/ 32:14	Jetsky C Sifful	ì
08269	TPH-DRO water C10-C28	SW-844 8015B		160120009 X	61/21/2015 13:12	Christine E Dolmar	- 1
07003	Extraction - DRO (Waters)	SW-846 35100	**	160130009A	01-20-2010 11:25	Denise I Trimny	1



^{*=}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster. PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW2S-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8207316

LL Group # 1623732 Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 13/2016 10:04 by DJP

Caribbean Airport Facilities

Suite 3

Submitted: 01/14/2016 10:00 Reported: 01/25/2016 11:32

150 Sector Central Cardina PR 00979

CAF2S

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
	latiles SW-846 TPH-GRC water C6-C10	8015B n.a.	ug/1 N.C	ug/1 100	ug /1 280	<u>S</u>
	troleum SW-846	8015B	ug/l	ug/l	ug/3	
08269	carbons TPH-DRO water Cl0-C28	n.a.	1,100	30	95	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01635	TPH-GRO water C6-010	SW-846 8015B	*	16020B20A	51/21/2010 14:47		5, 5,
	GC VOA Water Prep	5W-846 5030B		16076820A 16013000 2 A	01,01/2014 14:47 01/21/2014 21:06		_
08253	TPH-DRO water C10-C28	SW-846 89153		(50130 0035	01/22/2015 22:55		
07003	Extraction - DRO (Waters)	SW-846 35100	_	16013009 9 A	01 20 (2010 11.3)	Denise L Trimby	1



^{*-}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW1S-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8207317 LL Group # 1623732

Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01/13/2016 10:43 by DJP

Caribbean Airport Facilities

Suite 3

Submitted: 01/14/2016 10:00 Reported: 01/25/2016 11:32 150 Sector Central Cardina PR 00979

CAF1S

CAT No. Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Volatiles SW-846	8015B n.a.	ug/l N.D	ug/l 20	ug/1 50	Ĵ.
GC 1CCLOLCUM	8015B	ug/l	ug/l	ug/%	
Hydrocarbons 08269 TPH-DRO water C10-C28	n.a.	390	30	95	1

General Sample Comments

Laboratory	Sample	Analysis	Record
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CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01146	TPH-dRO water C6-C10 GC VOA Water Prep TPH-DRO water C10-C28	SW-846 8015B SW-846 5030B SW-846 8015B	<u>1</u> 1	14020B30A 16020B20A 160120009A	01/21/2018 18:52 01/21/2016 18:07 01/21/2016 18:34	Jesemy C Giffin	1 1 1
67003	Extraction - DRO (Waters)	SW-846 3510C		150186009A	01 20 (2016 11.20	Denise L Trimby	Т



^{*=}This limit was used in the evaluation of the final result



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Sample Description: MW1D-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8207318 LL Group # 1623732

Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01/13/2016 10:33 by DJP

Submitted: 01/14/2016 10:00

Reported: 01/25/2016 11:32

Caribbean Airport Facilities

Suite 3

150 Sector Central Cardina PR 00979

CAF1D

CAT No. Analy	sis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Pactor
GC Volatile	es SW-846 RG water C6-C10	8015B n.a	ug/l 28 J	ug/ 1 20	ug/l 50	1
GC Petrole	um SW-846	8015B	ug/l	ug/l	u g ∕3	
Hydrocarbo	ns RO water Cl0-C28	n.a.	130	31	95	1

General Sample Comments

	Laboratory Sample Analysis Record							
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor	
01146	TPH-GRO water C6-C10 GC VOA Water Prep TPH-DRO water C10-C28	SW-846 8015B SW-846 5030B SW-846 8015B	· - -	16018A20A 16018A20A 160180009 X	01/19/2016 20:37	Jeremy C Poffin Jeremy C Giffin Christine E Dolman	1. 1. 1.	
97003	Extraction - DRO (Waters)	SW-846 35100	1	1601900 9A	01/20/2016 11:25	Denise L Trimby	ľ	



^{*-}This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW8D-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8207319 LL Group # 1623732

Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01-13/2016 11:12 by DJP

Submitted: 01/14/2016 10:00

Reported: 01/25/2016 11:32

Caribbean Airport Facilities

Suite 3

150 Sector Central Cardina PR 00979

CAF8D

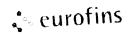
CAT No. Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Volatiles 01635 TPH-GRO water C6-C1	SW-846 0	8015B n.a.	ug/1 31 - J	ug/l 20	ug/ 1 50	1
GC Petroleum Hydrocarbons	SW-846	8015B	ug/l	ug/l	ug/1	
08269 TPH-DRO water Cl0-0	28	n.a.	490	30	95	1

General Sample Comments

	Laboratory Sample Analysis Record							
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor	
	TPH-GRO water C6-S10	SW-846 8015B	-	16018A20A	51/13/2016 21:04	Jersty C Piffin	1	
	GC VOA Water Prep	SW-846 5030B	2	16016A20A	01,13/2017 21:04		ì	
	TPH-DRO water Cl0-C28	SW-845 8015B		160130009A	61/21/2016 25:01	Christina E Doman	: 1	
07003	Pytyaction - DDO (Waters)	5%-846 35100		150190009A	01.20/2014 11.25	Denise & Trimby	1	



^{*=}This limit was used in the evaluation of the final result



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Sample Description: MW8S-W01 Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8207320 LL Group # 1623732 # 20530

Account

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling) caribbean Airport Facilities

by DJP Collected: 01/13/2016 11:19

Sunte 3

150 Sector Central Cardina PR 00979

Submitted: 01/14/2016 10:06 Reported: 01/25/2016 11:32

CAF8S			Method Detection Limit*	Limit of Quantitation	Dilution Factor
CAT Analysis Name	CAS Number	Result		ug/l	
NO.	6 8015B	ug/l	ug/l 20	5 .1	1
GC Volatiles SW-94	n . ± .	N.D.	u q /l	ug/l	
mr. 0.1	46 8015B	ug/l	ug, r		1.
GC Petroleum Hydrocarbons OR269 TPH-DRC Walter Clc-C18	n.a.	150	50	98	

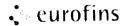
General Sample Comments

			,
Laboratory	Sample	Analysis	Record

		Labor	atory Sa	ample Analys	is Record		
CAT	Analysis Name	Method		Batch#	Analysis	Analyst	Dilution Factor
No. 01635	TPH-GRO water C6-C10	SW-846 8015B SW-846 8036B SW-846 8013B	1 - - -	14019A20A 16016A20A 160120049A	01/19/2014 15:06 01/19/2014 17:06 01/21/2016 15:54	三 月経すって火 しょうよんちゃつ	1
	TPH-DRO water C10-C28 Extraction - DRO (Waters)		-	160130909A	01/20/2010 11/25	Demise L Trimiy	•



^{*=}This limit was used in the evaluation of the final result



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Sample Description: MW8S-W01 MS Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8207321 LL Group # 1623732

Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01.13/2016 11:21 by DJP

Caribbean Airport Facilities

Suite 3

150 Sector Central Cardina PR 00979

Reported: 01/25/2016 11:32

CAF8S

Submitted: 01 14/2016 10:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
	atiles SW-84	6 8015B n.a.	ug/1 1,200	ug/ 1 20	ug /1 50	.ī.
GC Pet	croleum SW-84	6 8015B	ug/l	ug/l	ug/l	
-	carbons TPH-DRG water C10-C28	n.a.	1,400	3.0	94	1

General Sample Comments

		Labor	atory Sa	umple Analys	sis Record		
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01145	TPH-GRO water C6-C10 GC VOA Water Prep TPH-DRO water C10-C28	SW-846 80158 SW-846 50308 SW-844 80158	- - - - - -	16018A20A 16018A20A 160130009A		Jereny o Giffin Jezeny C Giffin Christine E Dolman	1 1 - 2
07003	Extraction - DRO (Waters)	SW-846 35100	1	16019000 9 A	01/20/2018 11:25	Debise I Trimby	1.





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Sample Description: MW8S-W01 MSD Grab Groundwater

CAF GW Monitoring Well Construction Project

LL Sample # WW 8207322 LL Group # 1623732

Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01/13/2016 11:23 by DJP

Caribbean Airport Facilities

Suite 3

Submitted: 01/14/2016 10:00 Reported: 01/25/2016 11:32 150 Sector Central Cardina PR 00979

CAF8S

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Pactor
	atiles SW-846 TPH-GRO water C6-C10	8015B n.a.	ug/l 1,200	ug/l 20	ug/l 60	1
GC Pet	roleum SW-846	8015B	ug/l	ug/l	ug /1	
Hydro 08269	carbons TPH-DRG water ClG-C28	n.3.	1,600	30	95	1

General Sample Comments

		Labor	atory Sa	ample Analys	sis Record		
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01146	TPH-GRO water C6-C10 GC VOA Water Prep TPH-DRO water C10-C28	SW-846 8015B SW-846 5030B SW-846 8015B		16018A20A 16018A20A 160180009A	01/15/2016 16:02 01/15/2014 16:02	Jereny (Giffin Jereny (Giffin Christine E Dolman	1 1 1
07003	Extraction - DRO (Waters)	SW-844 35100		1601300 09A	01,20/2316 11.25	Denies & Trimoy	.3



^{*=}This limit was used in the evaluation of the final result



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Sample Description: Equipment Blank Composite Water

CAF GW Monitoring Well Construction Project

LL Sample # WW 8207323 LL Group # 1623732 Account # 20530

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01/13/2016 07:35 by DJP

Submitted: 01 14/2016 10:00

Reported: 01/25/2016 11:32

Caribbear Airport Facilities

Suite 3

150 Sector Central Cardina PR 00979

CAFEB

CAT No. Analysis Name		CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Volatiles S 01635 TPH-GRG water C6-C10	SW-846	8015B	ug/l N.D.	ug/1 20	ug/1 \$%	1.
GC Petroleum S	SW-846	8015B	ug/l	ug/l	ug/l	
Hydrocarbons 08269 TPH-DRO water C10-C28	3	n.a.	140	31	97	1

General Sample Comments

Laboratory	Sample	Analysis	Record

		Labor	acory 5	mibre wrark:	10 100010		
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
0114€	TPH-GRO water C6-C10 GC VOA Water Prep TPH-DRO water C10-C28	SW-846 8015B SW-846 5030B SW-846 8015B) 1	16019A30A 16019A20A 160190009A	01/19/2016 13:44 01:13/2016 13:44 01/21/2016 20:23	derety C Biffin	1 1 1
97003	Extraction - DRO (Waters)	SW-846 35100	are.	1601809 09A	91/20/2018 11.2v	Denise L Trimby	1



^{*=} This limit was used in the evaluation of the final result



2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

by DJP

Sample Description: Field Blank Composite Water

CAF GW Monitoring Well Construction Project

LL Sample # WW 8207324

LL Group # 1623732 # 20530 Account

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01/13/2016 07:29

Caribbean Airport Facilities

through 01/13/2016 11:26

Submitted: 01/14/2016 10:00 Reported: 01/25/2016 11:32 Suite 3

150 Sector Central Cardina PR 00979

CAFFB

CAT No. Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Volatiles SW-84	6 8015B n.a.	ug/1 N.D.	ug/1 20	ug/l 80	a de la companya de l
GC 1CCLCLCL	6 8015B	ug/l	ug/l	ug/l	
Hydrocarbons 08269 TPH-DRO water C10-C28	n.a.	N.D.	31	96	ì

General Sample Comments

Laboratory	Sample	Analysis	Record
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			-	-			
CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01146	TPH-GRO water C6-C10 GC VoA Water Prep TPH-DRO water C10-C28	SW-846 80158 SW-846 5030B SW-846 80158	- -	16018A20A 16018A20A 160130009A	01/19/2018 14:11 01/19/2018 14:11 01/21/2018 17:51	Jereny C Siffin Jereny C Giffia Christine E Dolman	1 1
07003	Extraction - DRO (Waters)	SW-846 35100	V	16015000 9A	01/20/2016 11:25	Demise & Trimby	1



^{*-}This limit was used in the evaluation of the final result



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Sample Description: Trip Blank Water

CAF GW Monitoring Well Construction Project

LL Sample # WW 8207325

LL Group # 1623732 # 20530 Account

Project Name: CAF GW Monitoring Well Construction Project (Bimonthly Sampling)

Collected: 01 13/2016

Caribbean Airport Facilities

Suite 3

150 Sector Central Cardina PR 00979

Reported: 01/25/2016 11:32

Submitted: 01/14/2016 10:00

CAFTB

Limit of Dilution Detection Limit* Quantitation Factor CAT CAS Number Analysis Name Result No. ug/1ug/1ug/l SW-846 8015B GC Volatiles

01635 IPH-GRO water C6-C10

п.з.

N.D

20

50

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
	TPH-GRO water C6-C10	5W-846 8015B 5W-846 5030B	et - -	1601FA20A 1601FA20A	01/13/2016 14:39 01/19/2016 14:39	deraty C Griftin deraty C Griffin	1



^{*=}This limit was used in the evaluation of the final result

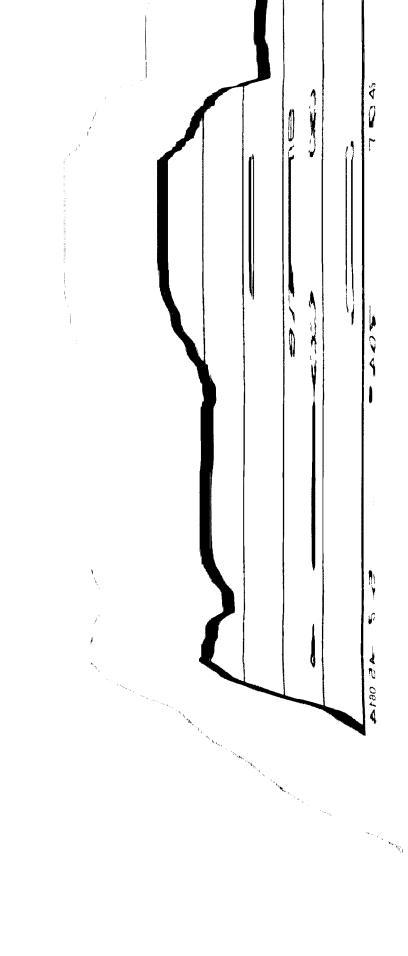
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Fernando L. Rodríguez	P.O. #:		pur	Ţ	হ ও			Š	SCR#;	
	PWSID #:		Jonet Jone Surfa	S.I					Preservation Codes	Codes
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Page 19 of 24

eurofins Lancaster Laboratories	Acd	Acci, # 20536	Group# 162373	2	Sample # 820 7313-2.	7313-25		
			Matrix		Analyses	Analyses Requested	For Lab Use Only	July
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APPENDIX B

Data Review Worksheets

Caribbean Airport Facility

Type of validation Full: Project Number:	Date:
REVIEW OF SEMIVOLATILE C	DRGANIC (SVOCs) PACKAGE
The following guidelines for evaluating volatile validation actions. This document will assist the make more informed decision and in better ser results were assessed according to USEPA data order of precedence Data Validation Standard Ope Concentration Semivolatile Acquired using SW-846 Method Revision 1); Validation Semivolatile Organic Compounds to (noted herein as the "primary guidance docume Evaluating Solid Waste, Physical/Chemical M. 1996)," specifically for Methods 8000/8270C and actions listed on the data review worksheets and otherwise noted. The hardcopied (laboratory name) reviewed and the quality control and perform SVOCs included:	the reviewer in using professional judgment to rving the needs of the data users. The sample a validation guidance documents in the following prating Procedure for Organic Analysis of Low/Medium and 8270C (SOW SOM01.2- SOP HW-35, August 2009 – by SW846 8270 (SOP HW-22, August, 2009 – Revision 4) ent"), Also, QC criteria from "Test Methods for lethods SW-846 (Final Update III, December e utilized. The QC criteria and data validation e from the primary guidance document, unless data package received has been data package received has been
Lab. Project/SDG No.: Sample matrix: Field blank No.: Trip blank No.: Equipment blank No.: Field duplicate No.:	
Data Completeness Holding Times GC/MS Tuning Internal Standard Performance Blanks Surrogate Recoveries Matrix Spike/Matrix Spike Duplicate Overall Comments:	Laboratory Control Spikes Field Duplicates Calibrations Compound Identifications Compound Quantitation Quantitation Limits
Definition of Qualifiers:	
J- Estimated results U- Compound not detected R- Rejected data UJ- Estimated nondetect Reviewer:	
Date:	

All criteria were met
Criteria were not met and/or see below

l.	DATA COMPLETN A. Data Packa		
MISS	SING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED
B.	Other		Discrepancies
			-

All criteria were met
Criteria were not met and/or see below

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of extraction, and subsequently from the time of extraction to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE	DATE	DATE	ACTION
	SAMPLED	EXTRACTED	ANALYZED	

Criteria

Extraction HT:	Aqueous	extract	within	7	days	from	sample	collection,	Soil:	extract	within	14
days.												

Analysis HT: Aqueous and soil samples: analysis within 40 days from date of sample extraction. Cooler temperature (Criteria: 4 + 2 °C):______

Actions: Qualify positive results/nondetects as follows:

If holding times are exceeded, estimate positive results (J) and nondetects (UJ).

If holding times are grossly exceeded, use professional judgment to qualify data. The data reviewer may choose to estimate positive results (J) and rejects nondetects (R).

If samples were not at the proper temperature (> 10°C), use professional judgment to qualify the results.

Criteria were not met and/or see below
GC/MS TUNING
The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits
The DFTPP performance results were reviewed and found to be within the specified criteria. If ion abundance criteria were not met, use professional judgment to qualify results. It mass assignment is in error (e.g., m/z 199 as base peak instead of m/z 198), all associated data are rejected (R).
All samples were analyzed within 12 hours of the DFTPP tuning. If no, use professiona judgment to determine if qualification is appropriate.
List the samples affected:

All criteria were met _____

All criteria were met	X
Criteria were not met and/or see below	

CALIBRATIONS VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:
Dates of continuing calibration:
Instrument ID numbers:
Matrix/Level:

DATE	LAB FILE ID#	ANALYTE	CRITERIA OUT RFs, %RSD, %D, r	SAMPLES AFFECTED

Criteria- ICAL

All RFs must be > 0.05 for all analytes.

All %RSD must be \leq 15 or correlation coefficients (r) > 0.99 for all except: %RPDs \leq 30% for CCCs:

Base Neutral: 1,4-Dichlorobenzene Fluoranthene Acid: Phenol

Hexachlorobutadiene Di-n-octyl-phthalate 2-Nitrophenol Acenaphthene Benzo(a)pyrene 2,4-Dichlorophenol

Diphenylamine¹ 4-Chloro-3-methylphenol

Criteria- CCAL

RFs \geq for SPCCs (N-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-nitrophenol, and 4-nitrophenol)

All percent differences (%Ds) must be \leq 20%.

Actions:

If RF < 0.05, estimate positive results (J) and reject nondetects (R).

If %RSD > 35% for target compounds (> 30 for CCCs) or a correlation coefficient < 0.99, estimate positive results (J) and use professional judgment to qualify nondetects.

If % D > 20%, estimate positive results (J) and nondetects (UJ).

A separate worksheet should be filled for each initial curve

¹ Cannot be separated from N-Nitrosodiphenylamine

All criteria were met
Criteria were not met and/or see below

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS	
					- - -
					- - -
Field/Trip/Equi	<u>pment</u>				
DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS	

All criteria were met
Criteria were not met and/or see below

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs of 10x the amount in the blank for the common contaminants (phthalates), or 5x the amount of any other compound. Specific actions area as follows:

If the concentration is < sample quantitation limit (SQL) and < AL, report the compound as not detected (U) at the SQL.

If the concentration is \geq SQL but < AL, report the compound as not detected (U) at the reported concentration.

If the concentration is > AL, report the concentration unqualified.

All criteria were met	
Criteria were not met and/or see below	

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery. Matrix: solid/aqueous

SAMPLE ID	BASE/N NBZ	IEUTRAL SUR FBP		COMPOUND IPH	ACTION	
QC Limits* (Aq	JL	to	to	to		
QC Limits* (So LL_to_l	lid) JL	to	to	to		
SAMPLE ID	ACID S PHL	URROGATE C) ГВР	ACTION	
QC Limits* (Aq	ueous)					
LL_to_l QC Limits* (So	JL lid)	to				
LL to l	JL	to	to	to		

NBZ = Nitrobenzene-d5 FBP = 2-Fluorobiphenyl TPH = Terphenyl-d14 PHL = Phenol-d5 2FP = 2-Fluorophenol TBP = 2,4,6-Tribromophenol

* Surrogate recoveries must fall between laboratory QC limits. If any surrogate is out of QC limits, there should be reanalysis to confirm that the noncompliance is due to sample matrix effects rather than laboratory deficiencies.

Actions:

Data are not qualified unless two or more surrogate %Rs within the same fraction (base/neutral or acid) are out of specification but > 10% or one surrogate %R within the same fraction < 10%. If surrogate %Rs are outside QC limit due to dilution, use professional judgment to qualify sample data. Surrogate action should be applied as follow:

QUALIFY RESULTS	%R < 10%	%R = 10% - LL	%R > UL
WITHIN THE SAME			
FRACTION			
(BASE/NEUTRAL OR			
ACID)			
Positive results	J	J	J
Nondetects results	R	UJ	Accept

All criteria were met	_
Criteria were not met and/or see below	_

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

MS/MSD Recoveries and Precision Criteria

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples.

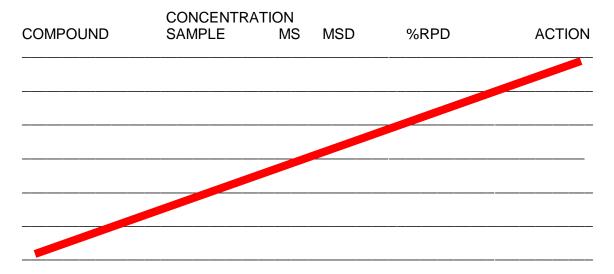
Sample ID:				Matrix/l	Level:
List the %Rs, R	RPD of the compounds	which do no	t meet t	he QC criteria.	
MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION

No action is taken on MS/MSD results alone to qualify the entire case. However, used informed professional judgment, the data reviewer may use the MS/MSD results in conjunction with other QC criteria and determine the need for some qualification of the data. In those instances where it can be determined that the results of the MS/MSD affect only the sample spiked, the qualification should be limited to this sample alone. However, it may be determined through the MS/MSD results that the laboratory is having a systematic problem in the analysis of one or more analytes, which affects the associated samples.

All criteria were met
Criteria were not met and/or see below

2. MS/MSD - Unspiked Compounds

List the concentrations of the unspiked compounds and determine the % RSDs of these compounds in the unspiked sample, matrix spike, and matrix spike duplicate.



Criteria: None specified, use $\%RSD \leq 50$ as professional judgment.

Actions:

If the % RSD > 50, qualify the results in the spiked sample as estimate (J). If the % RSD is not calculable (NC) due to nondetect value in the sample, MS, and/or MSD, use professional judgment to qualify sample data.

A separate worksheet should be used for each MS/MSD pair.

All criteria were met
Criteria were not met and/or see below

VIII. LABORATORY CONTROL SAMPLE (LCS/LCSD) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1.	11000	V CI I CO	Criteria

List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT	ACTION	

Criteria:

- * Use laboratory QC limits (LL = lower limit, UL = upper limit).
- * Refer to QAPP for specific criteria.

Actions:

Actions on LCS recovery should be based on both the number of compounds that are outside the %R criteria and the magnitude of the exceedance of the criteria.

If the %R of the analyte is > UL, qualify all positive results (J) for the affected analyte in the associated samples and accept nondetects.

If the %R of the analyte is < LL, qualify all positive results (J) and reject (R) nondetects for the affected analyte in the associated samples.

If more than half the compounds in the LCS are not within the required recovery criteria, qualify all positive results as (J) and reject nondetects (R) for all target analyte(s) in the associated samples.

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix (1 per 20 samples per matrix)? **Yes** or No.

If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected. Discuss the actions below:

		All criteria were met Criteria were not met and/or see below
IX.	FIELD DUPLICATE PRECISION	
Samp	ole IDs:	Matrix:

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which measures only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION

Criteria:

The project QAPP should be reviewed for project-specific information. RPD \pm 30% for aqueous samples, RPD \pm 50 % for solid samples if results are \geq SQL. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

SQL = soil quantitation limit

Actions:

If both the sample and the duplicate results are nondetects (ND), the RPD is not calculable (NC). No action is needed.

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria.

If one sample result is not detected and the other is $\geq 5x$ the SQL qualify (J/UJ).

Note: If SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is < 5x the SQL, use professional judgment to determine if qualification is appropriate.

	All criteria were met
	Criteria were not met and/or see below
X. LABORATORY DUPLICATE PRECISION	
Sample IDs:	Matrix:
_aboratory duplicates samples may be taken and	•

Laboratory duplicates samples may be taken and analyzed as an indication of overall precision These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which measures only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION

Criteria:

The project QAPP should be reviewed for project-specific information. RPD \pm 30% for aqueous samples, RPD \pm 50 % for solid samples if results are \geq SQL. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

SQL = soil quantitation limit

Actions:

If both the sample and the duplicate results are nondetects (ND), the RPD is not calculable (NC). No action is needed.

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria.

If one sample result is not detected and the other is > 5x the SQL qualify (J/UJ).

Note: If SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is < 5x the SQL, use professional judgment to determine if qualification is appropriate.

All criteria were met
Criteria were not met and/or see below

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area and/or retention times (RT) which do not meet the criteria for IS performance.

DATE	SAMPLE ID	IS OUT	IS AREA/RT	ACCEPTABLE RANGE	ACTION

Criteria:

- * IS area of +100% or -50% of the IS area in the associated calibration standard (CCAL).
- * Retention time (RT) within 30 seconds of the IS area in the associated calibration standard (CCAL).

Actions:

If an IS is outside the QC limit, it is recommended reanalysis to confirm that the noncompliance is due to sample matrix effects rather than laboratory differences.

Validation actions should be applied to compounds quantitated with the out of control IS as follows:

QUALITY	IS AREA < - 10%	IS AREA = -10 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction. Discuss actions below:

All criteria were met
Criteria were not met and/or see below

XI. COMPOUND IDENTIFICATION

The compound identification evaluation is to verify that the laboratory correctly identified target analytes as well as tentatively identified compounds (TICs).

1. Verify that the target analytes were within the retention time windows.

Verify that the quantitation of the target analytes and/or TICs using the correct internal standards.

If target analytes and/or TICs were not correctly identified, request that the laboratory resubmit the corrected data.

All criteria were met
Criteria were not met and/or see below

XII. QUANTITATION LIMITS AND SAMPLE RESULTS

The sample quantitation evaluation is to verify laboratory quantitation results.

- 1. In the space below, please show a minimum of one sample calculation:
- 2. If requested, verify that the results were above the laboratory method detection limit (MDLs).
- 3. If dilutions performed, were the SQLs elevated accordingly by the laboratory? List the affected samples and dilution factor in the table below.

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION
BEL-1305093	100 X	Matrix interference

If dilution was not performed, estimate results (J) for the affected compounds. List the affected samples/compounds:

Projec	t Number:	Date:
docum serving guidan Proced USEP/ HW-33 Conce Solid N 8000/8 the prin The ha	ollowing guidelines for evaluating volatile organic ment will assist the reviewer in using profession g the needs of the data users. The sample rence documents in the following order of preced dure for the Validation of Organic Data Acquired A National Functional Guidelines for Low/Mediur 3, August 2009 – Revision 2), the USEPA National Function Water (SOP HW-13, August, 2009-Reviewste, Physical/Chemical Methods SW-846 (F8260B are utilized. The QC criteria and data validation and guidance document, unless otherwise noted	data package received has been reviewed and
No. of Trip bla Field b Equipr Field d	Project/SDG No.: Samples: ank No.: blank No.: ment blank No.: duplicate No.: Data Completeness Holding Times GC/MS Tuning Internal Standard Performance Blanks Surrogate Recoveries Matrix Spike/Matrix Spike Duplicate	
	Il Comments:	
J- U- R- UJ-	tion of Qualifiers: Estimated results Compound not detected Rejected data Estimated nondetect	Data
IVENIEN	wer:	Date:

DATA COMPLETENESS

MISSING INFORMATION DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met
Criteria were not met
and/or see below

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	рН	ACTION

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH \leq 2, 4°C), no air bubbles.

Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.

Soil samples- 14 days from sample collection.

Cooler temperature (Criteria: 4 + 2 °C):

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).

If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)

If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).

If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).

If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).

If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).

If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

GC/MS TUNING
The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits
The BFB performance results were reviewed and found to be within the specified criteria.
BFB tuning was performed for every 12 hours of sample analysis.
If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.
List the samples affected:
If mass calibration is in error, all associated data are rejected.

All criteria were met _____ Criteria were not met see below ____

All criteria were met
Criteria were not met
and/or see below

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:
Dates of continuing calibration:
Instrument ID numbers:
Matrix/Level:

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.

All %RSD must be < 15 % regardless of method requirements for CCC.

All %Ds must be ≤ 20% regardless of method requirements for CCC.

It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of > 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.

If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects

If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).

If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).

If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).

If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met
Criteria were not met
and/or see below

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
Field/Equipment/	Trip blank			
DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS

All criteria were met
Criteria were not met
and/or see below

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene) ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and \leq AL, report the compound as not detected (U) at the SQL.

If the concentration is \geq SQL but \leq AL, report the compound as not detected (U) at the reported concentration.

If the concentration is > SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTANANTON	COMPOUND	OONO/UNITO	AL /LINUTO	001	AFFFOTED
CONTAMINATION	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED
SOURCE/LEVEL					SAMPLES

All criteria were met
Criteria were not met
and/or see below

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.

List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery. Matrix: solid/aqueous

SAMPLE ID		ACTION			
	1,2-DCA	DBFM	TOL-d8	BFB	
QC Limits* (Aqueous))				
LL_to_UL		to	to	to	
QC Limits* (Solid-Lov LL to UL		to	to	to	
QC Limits* (Solid-Med					
LL_to_UL	to	to	to	to	
1,2-DCA = 1,2-Dichlo	romethane-d4	ļ	TOL-d8 = Tolue	ne-d8	
DBFM = Dibromofluoi			BFB =	Bromofluorobenz	ene

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%. If any one surrogate in a fraction shows < 10 % recovery.

^{*} QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.

^{*} If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

All criteria were met
Criteria were not met
and/or see below

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:	Matrix/Level:			
MS OR MSD	COMPOUND % R	RPD	QC LIMITS	ACTION

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- * If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ). If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met
Criteria were not met
and/or see below

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:			Matrix/Le	vel/Unit:		
COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION	

Actions:

^{*} If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).

^{*} If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were met
Criteria were not met
and/or see below

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.

List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT

- * QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
- If QC limits are not available, use limits of 70 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R). If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.

If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

		and/or see below
IX.	LABORATORY DUPLICATE PRECISION	
	Sample IDs:	Matrix:

All criteria were met _ Criteria were not met

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.

Suggested criteria: RPD \pm 30% for aqueous samples, RPD \pm 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

		Criteria were net and/or see below
IX.	FIELD DUPLICATE PRECISION	
	Sample IDs:	Matrix:

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.

Suggested criteria: RPD \pm 30% for aqueous samples, RPD \pm 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met
Criteria were not met
and/or see below

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

- * Area of +100% or -50% of the IS area in the associated calibration standard.
- * Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO - 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met	
Criteria were not met	
and/or see below	

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

All criteria were met
Criteria were not met
and/or see below

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

			l
В.	Percent Solids		
	List samples which have ≤ 50 % solids		
Actions:	If the % solids of a soil sample is 10-50%, estimate positive resu	ults (J) and nondetects (UJ)	
	If the % solids of a soil sample is < 10%, estimate positive result	s (J) and reject nondetects	۲,